THE

FARMERS' LIBRARY

AND

MONTHLY JOURNAL OF AGRICULTURE.

VOLUME I.

S. Van Mensdaes

THE

MONTHLY

JOURNAL OF AGRICULTURE,

CONTAINING

THE BEST CURRENT PRODUCTIONS IN PROMOTION OF AGRICULTURAL IMPROVEMENT, INCLUDING THE CHOICEST PRIZE ESSAYS ISSUED IN EUROPE AND AMERICA.

WITH

ORIGINAL CONTRIBUTIONS FROM EMINENT FARMERS AND STATESMEN.

JOHN S. SKINNER, EDITOR.

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TO THE MONTHLY JOURNAL OF AGRICULTURE FOR 1845--6.

MONTHLY

JOURNAL OF AGRICULTURE.

NO. 1. JULY, 1845. VOL. I.

MEMOIR OF THE LATE STEPHEN VAN RENSSELAER,

AS THE FRIEND AND PATRON OF AGRICULTURE.

In offering to the public what it is hoped may constitute a large portion of a diversified and suitable LIBRARY FOR AMERICAN FARMERS—in which it is proposed not only to illustrate the science and to encourage the literature of their pursuit, but to journalize such practical results of associated and individual exertions as may at once denote and further the progress of Agricultural improvement—would it not be strange if we did not attempt to pay particular respect, as we go along, to the memory and services of those who have been called beyond that bourne whence no traveler returns?—men who, though now beyond the reach of flattery or favor, devoted, when among us, their time and fortunes to the promotion of that great concern, of which Washington himself hath said—"I know of no pursuit in which more real and 'important service can be rendered to any coun-'try than by improving its agriculture—its 'breed of useful animals, and other branches of 'a husbandman's care."

In consideration that our design, though intended for all who take an interest in rural affairs, has its *fulcrum*, or resting-point, here in New-York, there would seem to be a natural propriety in turning to do justice to him, among the first, who, though born in this city, embraced with his munificence the welfare of the whole agricultural community.

What General VAN RENSSELAER did for the farming interest, was not confined to particular acts—such as the importation of improved animals, and donations for public exhibitions of rural industry, judicious and liberal as these were. His contributions were made in a spirit of broader philanthropy. He caused, as we shall see, Institutions to be founded, and Sciences to be taught, that men might be, intellectually, better fitted to get along in this world as we find it, enjoying the greatest of all earthly blessings—self-respect, and the sense of personal independence. In thus going at once to the root of all social improvement, to lay its foundation where alone it can be laid, to last, IN THE MORAL CULTURE OF THE RISING GENERATIONS, the Patroon took the lead of his own age, and helped to form ours—ours, in which it is getting to be universally admitted that our political institutions, the condition of society, in fact all the circumstances of our country, demand a radical change in our educational systems. These must be generally more industrial than they are in their plan and character. The great, almost the entire mass of every generation is doomed to labor daily at some industrial occupation for a livelihood.—There is no security that the children, even in the first generation, of those who are in comparative affluence, shall not be brought, by unfortunate speculations, by the unavoidable accidents of trade, by prodigality, nay by our organic laws for the descent and distribution of property, to earn their bread by the sweat of their own brows. God himself hath kindly ordained that so it should be. Far from labor being a curse, if we take laboring-men as a class, they enjoy as such the greatest share of happiness, with the least alloy, if the labor be not immoderate, and its avails made *certain*.

From all his plans and actions, it is obvious that the Patroon had profoundly reflected on the defects in our systems of instruction, and thoughtfully scanned the spirit of our institutions; and having thus discerned the true wants of society, he was not the man to withhold his personal attention, or his bounty, where a great

social good was to be achieved; yet was there no ostentation in his beneficence. He acted truly as if he would not let his left hand know what his right hand did.

"No! no! his hand was opened—yet no sound
Of trumpet went before—though rich and free,
His bounties oft, like streams beneath the ground,
Unseen, poured treasures sparkling to the sea."

In founding, at his own expense, the "VAN RENSSELAER INSTITUTE," at Troy, of which we shall presently have occasion to speak more particularly, he evidently anticipated and acted on the convictions of an able writer, of very recent date, whom we must take leave to quote, even at the risk of prolonging this notice unreasonably; and that, not more to illustrate the forecast of the great friend of agricultural improvement, who is the subject of these remarks, than because, under no auspices more appropriate than under his name, could any observations be introduced to elucidate a subject which, though every day gaining in popularity, can in no wise be exaggerated in respect of its importance. Let us invoke, for this quotation, the particular regard of all opulent men who *ought*, and of benevolent men who *do*, exercise an influence in devising and forwarding plans for educational improvement.

"The education necessary for industrial pursuits is very generally underrated in this country, and from *this cause alone* springs a great deal of our want of industrial knowledge. Our ignorance is so great that we are even incapable of estimating its extent. If a boy is to be sent to a *profession*, great care is taken with his education. Literature and Science present themselves to him hand in hand. A reputation, the best passport to professional success, may, it is said, be founded on school and college character, and his ambition is excited by the social and political eminences which professional men may attain. But if he is going to trade or agriculture, education, it is thought, would be thrown away on him. If he can read and write and cypher, it is supposed to be enough. Should an ambitious parent desire to give his son a good education, although he is to be in trade, he puts him through college. He devotes the best years of his youth to reading Grecian poetry and Latin plays; to learning by rote the dialectics of the middle ages, and principles of abstract metaphysics; and awakens, after the solemnity of getting his degree, to find that he is to obtain his living by principles and pursuits to which his education has had no reference whatsoever. He finds that the safety of his property may depend on the navigation of a sea, of which he never heard whilst laboring for months to understand the geography of the Odyssey; that the mode of growth, or the chemical composition of a plant, of whose existence neither Greek nor Roman knew, may be the means of gaining or of losing fortune, and of it he has been left in ignorance; that his daily commercial intercourse is with men and nations, of whose languages and whose customs he is totally ignorant, whilst he has spent his youth in learning how he should have spoken had he lived three thousand years ago.

"It is very well for those, who, independent in fortune, and devoted rather to ease than enterprise, wish to dream through an existence which offers to them but roses they did not plant, to seek in the literature of past ages, an elegant and innocent occupation. Indeed, to all classes the literature of present and of former times, of our own and of foreign countries, presents a relief from the weary continuity of action, which industrial progress requires. To the man of business, there can be no enjoyment greater than to transport himself from the anxieties of the desk or factory, to communion with the best lessons, which human intelligence has handed down, or to obtain, within a few volumes, the records of the greatest deeds, the noblest struggles, and the holiest thoughts which have been allowed to man. But this is not his business. This knowledge is not that by which he is to live, and the first object of one dependent on his own exertions must be to employ them, to educate his faculties specially with regard to their future use in the development and the improvement of every part of whatsoever line of business he embarks in.

"The idea of there being no direct connexion between trade and education, has derived support, with many persons, from the examples of individuals, highly educated, failing entirely when they engaged in trade or agriculture, whilst other men, of no educaiton whatsoever, have been brilliantly successful in industry.—This argument is, however, when analysed, strong on the other side. What is called education by those persons, is not so, it is, on the contrary, worse than no education whatsoever. If a man knows Greek and Latin, if he can expound all the niceties of metaphysics, what does it avail him when he proceeds to spinning cotton, or to smelting iron; quite the reverse. His habits and modes of thought are at every moment shocked by the rough clashing of the realities on which his fate depends. His mind, accustomed to discussions, which, whether right or wrong, leave life as it has been before, becomes appalled at the stern calculations of a problem, in which his liberty, his home, his fortune is involved. The man is not able for his position, and he fails; but he fails not because he was an educated man, but because he was not educated for his trade."

For a fuller memoir, embracing a history of his family, his education, and his public life and services, to other institutions and pursuits, the reader is referred to an "able and interesting" obituary discourse, as it was most justly characterised when pronounced, by Hon. D. D. BARNARD, at a meeting and by request, of the "ALBANY INSTITUTE," of which, at its first organization, General Van Rensselaer, then in Congress at Washington, was unanimously elected President, and so remained until his death.

For this discourse, to which we refer, most conveniently, for facts with which his contemporaries only may now be quite familiar, we are indebted to Doctor T. ROMEYN BECK, who was deputed, in his character as Chairman of the Committee of Arrangement, to solicit a copy, and who from personal relations to the deceased, might well be designated as the organ for any office, that might best imply their reciprocal

confidence and esteem, and his own heartfelt participation at the common grief for the loss of one, who was opulent without pride, and wise without pretension. Of his very last moments, the estimable and accomplished author of the discourse, remarks: "He departed this life, on Saturday, the twenty-sixth day of January last. [1839.] It was at four o'clock in the afternoon, of a day which had dawned upon him with as fair a promise of closing on him, in life, as any perhaps which he had seen for the last two years, that, in a small cabinet of his ample mansion, which infirmities had made his chief asylum and sanctuary, for many months, sitting in his chair, with just warning enough of serious change previously, to alarm the fears of anxious and trembling hearts around him, the venerable man bowed his head and died." Recent incidental circumstances enable us to add, in proof of his well-founded self-possession at the last moment, that, on experiencing an extraordinary suffocating sensation, premonitory of immediate dissolution, he calmly observed—"My son, can this be death?" And how truly might he, if any man could, have added—"Oh, death! where is thy sting? Oh, grave! where is thy victory?"

The Patroon was born in the City of New-York, on the first day of November, 1764. His father was Stephen Van Rensselaer, proprietor of Rensselaerwyck, a manor of 48 miles by 24 in extent. His mother was Catherine, daughter of Philip Livingston, of the family of that name, to which belonged the Livingston Manor. Mr. L. was one of the signers of the Declaration of Independence. The Patroon's first school instructor was John Waters, when the profession of Instructor was regarded, as it really is when well sustained, one of the highest honor and usefulness. He was next sent to school at Elizabethtown, N.J.; but the troublous times of the Revolution coming on, he was driven thence to Kingston, where he obtained the first elements of a classical education, under Mr. John Addison, a shrewd, well-educated Scotchman, who afterward became a man of consideration in the State. In 1779 he was placed in the family of Doct. SAMUEL SMITH, under the instruction of him and his father-in-law, the celebrated Doct. Witherspoon, President of Princeton College; but "Princeton was still too near the seat of War; and the next year it was thought advisable to move the collegian to the University at Cambridge, then, as now, a distinguished and leading school of the higher kind in the United States. There, in 1782, in the nineteenth year of his age, with respectable attainments in the classical and other learning of the time, he took his first degree in letters as a Bachelor of Arts." A few days since, we were favored with a sight of his Thesis, written on this occasion, and yet preserved with filial reverence by his son and successor, who occupies the old Manor House, which he has tastefully enlarged without altering; observing all its pious exercises of family worship, and keeping up its ancient and elegant hospitality, in the midst of a charming family circle, with apparently nothing wanting to fill up the measure of virtue and of happiness. A well-stored library, shaded walks, and a garden adorned with every flower, and redolent of every sweet. What more can mortal man in this life desire or deserve?

Before he was twenty, General Van Rensselaer was married to the third daughter of Gen. PHILIP SCHUYLER, and thus became connected "by relationship (and one, as it proved, of great confidence and affection) with another of those extraordinary men whose names so crowd and illumine the pages of our Revolutionary history."

Though we shall therein extend this notice beyond the limits we had prescribed, it being our purpose only to embrace such incidents as might serve to present an outline view of his life, and that *especially as it was devoted to the promotion of Agriculture*, we cannot forbear, in the hope of the good it may do, to copy what is so well said by the more able and ample obituary notice before us.

"It was in the spring of 1787, when he was short of twenty-three years of age, in the vigor of manhood, just on the threshold of mature life, which sparkled brightly before him—with large possessions and wealth enough to lay the world under contribution for whatever it can afford to pamper appetite and passion, and supply the means of wanton and luxurious indulgence; it was then, and under such circumstances, that he deliberately chose, by a formal profession of religious faith, and a personal vow of religious obedience according to the doctrines and discipline, of the Christian Church, as adopted by the Dutch Reformers, to pledge himself to a life of temperance, simplicity, truth and purity. How well he kept his vow is known to all who had occasion to observe him; and how eminently he was blessed in keeping it, was seen in all those quarters where, I think, the Christian is wont to look for *the promise of the life that now is*—in the calm and quiet of a peaceful existence, in domestic relations of the most tender, harmonious and beautiful character, and in a resigned, appropriate, and happy death."

If we are led away from the line of observation within which we had intended to confine ourselves upon his character *as a Farmer and the friend of Farmers*, something must be allowed to our admiration of the man, and, may we not add, to our feelings as a friend?—To return within that line:—In 1802, Mr. Van Rensselaer married his second wife, Cornelia, daughter of William Patterson, a distinguished citizen of New-Jersey, by whom he had nine children, who still "afford the most satisfactory proof, that the example, instruction, and influence of Parents have been worthy of all approbation."

It should have been sooner mentioned, were it only in justice to his mother, that the Patroon was but five years old when he lost his Father, leaving the tender portion of his minority under her vigilant guardianship—long enough, says Mr. Barnard, "to receive those deep impressions of the value of religious faith, and the beauty of holy things, which were finally wrought firmly into the texture of his character." How often, let us add, on the boy at the Mother's knee, is form and pressure given to the character, the man! From her's, as from an angel's tongue, some conservative precept is addressed to his unformed mind, and sinking deep into his careless and sensitive heart, though the dear Mother may then be called away,—though orphanage, and poverty, and cruel neglect may unite to efface the holy impression, there it remains to fortify and to guide him—to support him in adversity and (under a higher power) to deliver him from evil. Hence has it been that the wisest and the best men have with gratitude ascribed to Maternal care all that manhood has won for them, of honorable and virtuous renown. How responsible then is the Mother's office! How full of true glory, when well performed!—Is that glory awarded by the world as often and as distinctly, as when earned by the other sex?—let that other sex and the world answer!

In 1810, a commission was instituted to explore a route for a Western Canal, which laid the foundation of the great system of internal improvements in this State. GOVERNEUR MORRIS, MR. VAN RENSSELAER, and Governor CLINTON—enough to render the enterprise illustrious, were of the commission. Accompanied by the Surveyor, they personally explored the route of the present Canal, from the Hudson to Lake Erie; traveling chiefly on horseback, and "not always without serious difficulty and much deprivation, from the uncultivated state of the country." "Sometimes they made the heavens their canopy and shelter for the night."—Their report, written by Governeur Morris, was made in 1811, and the subject of this memoir, being then in the Legislature, by his exertions and influence materially contributed to its success. "This magnificent project, interrupted by the war, was resumed in 1816, when a memorial of great ability from the pen of Clinton, was presented, followed by a Report from the Commissioners, the Patroon being at their head; and in April of that year, the Legislature authorised the commencement of the great enterprise, to which, from its first conception to its completion, he gave all the benefit of his personal attention, and all the weight of his character. From that period to his death, he was a member of the Board, and its President for nearly fifteen years—from April, 1824, "when the name of his friend, the great Clinton, was struck from the roll of Commissioners."

In estimating the value of works of internal improvement, and awarding the honors due to the genius that conceives and the perseverance that carries them through, we are too apt to confine our consideration to their instrumentality in the creation of national wealth.—True, it must be admitted, their value in that light deserves to be highly rated in proportion as they convey the raw materials for manufactures to appropriate localities, and create wealth by opening a market to the productions of otherwise dormant but rich mines of lime, of coal, of iron, and to the productions of agricultural regions theretofore inaccessible; but such works deserve encouragement yet more as the promoters of knowledge, and civilization. Where men live in the gorges of mountains, or in the solitude of frontier settlements, without facility of communication with their fellow men, their minds become contracted, and sloth and ignorance and prejudice take the place of intelligence, sociality and civilization. An enlightened French Minister, in speaking of the cost of manufacturing iron in France, as affecting rail roads, said, "The question of the 'price of iron!—it is the question of roads, the 'question of communications, of intercourse be-'tween man and man—of the obliteration of 'prejudices—of the production of mutual amity, 'of morality and civilization."

But we must not here indulge in reflections which might so easily be amplified and illustrated, and which have been only thus far expressed in the way of demand for more enduring honor and gratitude to those, who, in projecting the great work that has connected the Hudson with the Western empire, have not merely added to the agricultural and commercial wealth and population of the country. They have achieved the highest aim of the Legislator—the crowning glory of the Philanthropist; for they have quickened the intercourse, improved the minds, refined the morals, and *promoted the harmony and union of the American people.*

In March, 1819, Mr. Van Rensselaer was elected by the Legislature a Regent of the University, and was Chancellor of it when he died—having been elected to that station on the death of the venerable Simeon De Witt in 1835.

In the same year, 1819, an act was passed, by his influence and that of other patriots united, "FOR THE ENCOURAGEMENT AND IMPROVEMENT OF AGRICULTURE." County Societies were to be formed; and the Presidents of these, or Delegates, should the Societies choose to elect them, were to form a central BOARD OF AGRICULTURE. This law, with the Board it created, expired by its own limitation; but, says the "discourse" from which our facts are gathered, "It lasted long enough to demonstrate the inappre-

ciable value of legislative aid and encouragement to the agricultural interest; and raised to itself an enduring and noble monument, by the publication of three very valuable volumes and memoirs."

In these volumes will be found papers which present complete views of the geological and agricultural features of Albany and Rensselaer Counties, made by scientific gentlemen, exclusively at the expense of the Patroon, the President of the Board. It is believed they were the first attempts made in this country, says the memoir, "to collect and arrange geological facts with a direct view to the improvement of Agriculture." Having caused these surveys to be published at his own cost, and gratuitously distributed, he next turned his attention to a more extended survey, which was accordingly carried the entire length of the State, on the line of the Erie Canal.

All these munificent enterprises, so much in advance of the times, appear to have been but preliminary to yet more extensive contributions to the science of Geology. Thus it was that, in 1823, Professor Eaton, in a manner that enrols his name high in the ranks of men of science, completed his grand survey, extending from Lake Erie to Boston, about 550 miles, embracing a belt of fifty miles wide. In 1824, a publication was made containing the results of these surveys, with illustrative maps. "Attention was strongly attracted, both in this country and in Europe, to the very creditable and faithful labors of Professor Eaton, prosecuted under the direction of his munificent patron; and this example it was, unquestionably, which has led at last to the adoption, in several of the States, (and this among the number,) of plans for exploring their territories at the public expense, in search of scientific facts, and of the mineral riches, and other substances of economical value, to be found upon or beneath the surface of their respective portions of the earth."

If, in the sketch so far presented of General Van Rensselaer's contributions to the general stock of agricultural knowledge, it should be thought that undue importance has been attached to his forecast, and his liberal expenditures for *geological surveys*, and analyses of the various soils and substances they developed, it must be because the importance of Geology itself to practical Agriculture is underrated.—Those, as we apprehend there are too many, who do not see at once their intimate and essential connection, may be advised to remember that though, of the elements existing in animals and plants, the four which are supplied by the atmosphere and water constitute by far the largest proportion; yet all the remaining elements, in much greater number, are equally indispensable to a healthy existence of plants, and must be derived from the *soil on which they are cultivated.*

The general interest of the subject, as well as the obligation to illustrate the merit we claim for the deceased, on account of the several and extensive geological surveys made at his instance and expense, will justify us in taking space for, and calling the attention of the practical reader to, the following extract from a writer already referred to, from which our own impressions, better expressed by himself, have been in part derived:—

"The objects of the philosophical agriculturist, as well as the most effectual means of advancing husbandry, consist in—

"1st. *Studying the composition of the soils;*

"2nd. Studying the action of plants upon it.

"The soil is formed by the decomposition of the minerals of which the crust of the globe consists. The water which flows over the surface is absorbed into the pores and fissures of the rocks; and in winter, on freezing, it expands with such irresistible force as to crumble down even the materials of the densest and hardest stone. The pulverulent or gravelly material so afforded, is carried down by rains or floods to the lower grounds, and, spreading over the more level country, forms the cultivatable soil. Independent of the mechanical action of water, the constitution of numerous rocks is such as to cause their gradual decomposition by its chemical action, as in the case of felspar and other minerals; and, by the direct action of the atmosphere, all rocks which contain protoxide of iron very rapidly decompose and crumble down.

"Such being the origin of the soil, its constitution will be easily understood to depend on that of the rock from which it has been formed; and as on this constitution its fertility, or its power of supplying plants with the materials they require for their growth, mainly depends, it will be seen that the agricultural capabilities of a country are immediately connected with and dependent on *its geological character.* A district, of which the rock is simple in its constitution, cannot furnish a fertile soil. A pure quartz rock, or a pure limestone, could only furnish, from its soil, to plants, lime or silica; and they should hence languish for want of other equally important elements. The edges of a geological district, where various rocks are in contact, will, therefore, always be more fertile as to soil than its interior; and the more numerous are the rocks in its neighborhood, and the greater the diversity of their mineral character, the more complex will be the soil furnished by their decomposition, and by its power of furnishing the elements of growth to different kinds of plants, the greater will be the range and energy of its fertility."

With increasing years, seems to have increased his constant wish to be sowing the seeds of knowledge and humanity. Thus it was, that, having now attained his threescore of years, the Patroon employed Professor Eaton again to traverse the State, prepared now, with apparatus and specimens, to deliver, in all the principal towns and villages, familiar lectures on Chemistry, Natural Philosophy, and various branches of Natural History.

The encouraging results of this experiment stimulated him finally to establish a school, of which, as he declared, his principal object was to "qualify teachers for instructing the sons and daughters of Mechanics, in the application of Experimental Chemistry, Philosophy and Natural History, to Agriculture, Domestic Economy, and the Arts and Manufactures."

This school, established at Troy, was incorporated in 1826, under the name of the "RENSSELAER INSTITUTE." "It may be described," says Mr. Barnard, "as a school for thorough and complete instruction, in the circle of the natural sciences, applicable, in any way, to the economy or business of life in all its civil departments—not however including those usually denominated professional. The peculiarity in the mode of instruction, originally introduced, has been adhered to; and the distinguishing and eminent advantage gained by this peculiarity of method has been, not only that the students themselves have been thoroughly taught, and are ready, at all times, professionally or otherwise, to make a practical and highly useful application of their knowledge, for their own benefit or the benefit of others, but that, whether such is their occupation and business, or not, they go out to the world as an army of Teachers, so familiar with the various subjects of their knowledge, and so fitted and accustomed, from long habit, to impart it, that they become involuntarily the school-masters and instructors of every circle into which they enter. They are lights and luminaries to the prevalent darkness that may surround them, gentle and mild, but radiant and steady, in whatever orbit they may chance to move.

"It is impossible to compute, or perhaps to give any rational conjecture, about the amount of good which has already been effected through this munificent and skilfully-devised charity—much more impossible is it to compass, in thought, the benefits which coming generations must reap from that system and plan of Education, of which the example was first set, and the eminent utility satisfactorily tested, in the Rensselaer Institute. Schools have been set up on the Rensselaer method, in various and distant parts of our country; and it has been stated to me as a fact, from calculations actually made, that the Institute has itself furnished to the community, more experimental Teachers and Professors, State Geologists, Principal and Assistant Engineers on Public Works, and practical Chemists and Naturalists, than have been furnished, in the same time, by all the Colleges in the Union. If the half of this statement be true, the result, in this single particular, is a proud one for the memory of the Patron through, whose almost unknown munificence it has been effected."

The friendship with which we were honored by the venerated subject of these details, enables us to state, with distinctness of recollection founded on personal agency in the transaction, an instance of liberality and public spirit, that ought not to be omitted in a memoir which seeks not to dwell on his numerous public, and yet more numerous private charities, but to refer only to his munificence in the *cause of American husbandry*, and of *education* which contributes to the prosperity of every interest and the growth of every virtue.

As far back as 1822—vigilant in all things transpiring for the rural promotion of economy—he had noted the meliorations which had been effected in the points and properties of *cattle*, in England, by the efforts o the Collingses and others in establishing the breed of "Improved Short-horns," distinguished, as it was said, for mellowness of handling, propensity to feed at an early age, and great aptitude to take on fat. He called on the writer of these remarks (then conducting the old "American Farmer,") as was his wont in passing through Baltimore, to and fro, between Albany and Washington, to converse on his favorite topic; and, giving him a *carte blanche*, requested him, by whom Champion, Shepherdess and White Rose had been then recently imported for his friend, and kindred spirit in munificence, Robert Oliver, of Baltimore, to order for him a Bull and two Heifers, from the same highly respectable breeder, the late Charles Champion, of Blythe. In making this importation, it was not from any personal conviction of the superiority of this race over our native breeds, for which he had enjoyed no adequate opportunities, much less was it with any view to personal gain, being willing, he said, to risk whatever they might cost for the public good that might result from disseminating, such excellent qualities as they might be found to possess. A Bull and two Heifers, Washington, Conquest and Pansy were accordingly imported, at a cost, in England, of $1050. Of the first, Mr. Champion observed in his letter to Mr. Skinner, "I do not hesitate to say that Washington possesses more valuable points, substance, and desirable qualities of flesh, with as light bone and offal, as any bull I ever saw, and I feel great pleasure that I have such an animal to send to a gentleman you estimate so highly, as General Van Rensselaer."

Again we pray the reader not to blame us for the length of this Memoir. Let that rather be ascribed to the long catalogue of good deeds which illustrated and adorned the life of him whom we have attempted to hold up as the untiring patron of the concern which it is the great purpose of the "FARMERS' LIBRARY" to promote. An unvarnished chronicle of all his acts of public and private munificence, as far as, without any wish of his, they came to the knowledge of the world, would fill a volume.

True it may be said, in view of the Patroon's immense possessions, "of those to whom much is given, much will be expected,"—but no caviling can rob him of the merit of having met this fair requirement. Let us only hope that his example may be followed by those whom chance or industry may have blessed with superfluous fortune; for as none can take that

with them to the grave, how else can all that is superfluous be better bestowed than in augmenting the means of social comfort and the stock of useful knowledge?

Though, under the circumstances alluded to in the commencement of these remarks, our first regards seemed to be due to him, we shall not fail in respect to other eminent departed worthies, whose memory deserves to be cherished by every friend of Agriculture. All of whom we can get suitable memoirs, shall have their places of honor in the FARMERS' LIBRARY; for who, however it may be contrary to the mistaken public sympathies and perverted legislation of the day,—who, let us ask, really so much deserve public approval, and the homage of posterity, as those who in their own walks set examples of industry, and by their munificent exertions and expenditures have taught us to make honest industry most efficient and available? As compeers in the advancement of the cause which it will hereafter be our duty, as it has ever been our pleasure to advocate—for be it once more observed that it is only in that career of common service for a common good that we presume to hold them up, as the feeblest hand, in the want of a stronger, may hold a lamp to the footsteps of the inquiring wayfarer. With their sentiments as politicians and Statesmen, however variant these may have been, we have no concern. Detested be the prejudice that would lead us to value them the less as men, or as husbandmen, for any honest difference of opinion between them as Statesmen; and here, once for all, be it proclaimed, that if, on any occasion, either from obscurity of expression on our part, or obliquity of the reader's vision, we may appear to indicate any party-political bias, or to use the pages of this Journal to propagate political or religious dogmas, or to foment sectional antipathies, we repudiate before hand an imputation as odious as it would be unjust. Finally, in place of having unwarrantably prolonged this memoir on the services rendered by the Patroon to the two great associated interests of AGRICULTURE and of EDUCATION, we are but too conscious of having fallen short of what was due alike to his sagacity and his munificence—yet must here close it, with the fervent ejaculation of a pious friend who knew him well—

"Yes, he was greatly good, and nobly wise—
The Christian, Patriot, Gentleman and Sage.
Go learn of him, wherein true wisdom lies.
Study his life—and may the hallowed page
Thy zeal inspire, and all thy powers awake
Like him to live—like him at last to die;
And then, when death life's golden cord shall break,
Like him, to find a better life on high."

DEEP PLOWING.

ONE EXPERIMENT TO ASCERTAIN ITS EFFECTS.

With some Remarks on the Writings of THOMAS MOORE, of Montgomery County, Maryland, and JOHN TAYLOR, of Caroline, Virginia.

ONE of the earliest incidents, within our recollection, which served to impress upon our minds the scope which practical Agriculture offered for the exercise of the *mind*, was the reasoning contained in a pamphlet written by THOMAS MOORE—and if we could get a likeness of him, we would have him engraved for the FARMERS' LIBRARY, and with it publish a memoir of what he did for the improvement of Southern or Middle States Agriculture, even though it might serve to preserve, besides his likeness, nothing more than the pamphlet before mentioned. All we remember of him is that he belonged to the Society of Friends, who, proverbially, make good Farmers; that he was of Montgomery County, Maryland, where some of the best Farmers, of that same friendly persuasion, now reside, to illustrate the beauties of good management and unostentatious hospitality; that he had a turn for Engineering; and that we understood Mr. Jefferson was always glad of an opportunity to converse with him on Agriculture.

It was the habit of the Editor's father to devour every thing he could get hold of on Agriculture—of which, however, scarcely any thing ever offered, except an occasional pamphlet, or newspaper essay. Of the former, few ever prompted more reflection, or more efficiently promoted great improvement, than this little pamphlet on *deep plowing*—entitled, as well as we can remember, (for we were very small when made to read it "out," as it was called,) "THE GREAT ERROR OF AMERICAN AGRICULTURE EXPOSED."

It was about that time, too, that the celebrated essays of "ARATOR," from the pen of the celebrated "JOHN TAYLOR OF CAROLINE," appeared in, first, we think, a Georgetown, (D. C.) paper. These served to give an impulse to Southern Agriculture, resembling in some measure the influence of a great storm when it

comes to agitate the bosom of the peaceful Ocean.

On concluding, for the reasons given in the Memoir of Gen. Van Rensselaer, that it would be even more imperatively just than politic to record in the Farmer's Library what we could yet recover of the benefactions of departed friends to American Agriculture, our first thought and endeavor was to get a portrait and appropriate notice of the Author of ARATOR.

Although so far disappointed, we do not yet despair of some success.

We are aware, as to deep plowing, that some regard is to be had in the first instance to the depth of the top soil. Early opportunity will be taken to present the subject in all its aspects, as it has been explained and illustrated by Johnson and others in Europe and in America. Our purpose for the moment is only to give the following, the perusal of which suggested the foregoing hasty remarks:—

Account of an Experiment in Deep Plowing.

BY REV. JOHN JAFFRAY, DUNBAR, EAST LOTHIAN.

[*Premium, Five Sovereigns.*]

THE experiment was made upon a small field, which is sixty-five feet above the level of the sea. The soil is sandy, resting upon a subsoil of sand and gravel of great depth, and so thoroughly drained by the declivity of the surrounding lands, that want of moisture is its natural defect. There is but little difference between the soil and the stratum on which it rests beyond what culture and manure have made; but, from sinking of gravel, treading of horses, and pressure of the plow, year after year, and age after age, the subsoil had become crusted, hard, and beaten as a road. In short, from shallow plowing, there was but little depth of cultivated earth; and, as on all such soils in dry seasons, the crop was scorched and scanty.

With a view to render this field fruitful in any season, it was subsoiled with the Deanston plow, eighteen inches deep, and sown with wheat for crop 1837. The great vigor and luxuriance of the crop attracted general notice; and it must have yielded an extraordinary increase, if it had not been lodged by wind and rain shortly after the ear appeared. Therefore it gave only thirty-eight bushels of grain per acre, but three tons of straw, which proved its great strength. To this crop, one of potatoes and two of wheat succeeded; but it is the culture of this field for crop 1841, and the result, which chiefly constitute this report.

It was all equally dressed with seaware; and four acres of the same quality and description were measured and staked off. Two of these acres were plowed twelve inches deep with two horses, and two of them eighteen inches deep, with four horses. These two portions in all other respects were cultivated and managed exactly alike. They were planted with potatoes of the Don species in the last week of April, eight inches deep, twelve inches asunder, and in drills thirty inches wide, running at right angles to the furrows of the experimental plowing. The potatoes were planted deeper than usual, therefore the shoots were longer in coming through the ground; but, when they did appear, it was with great strength and regularity. They expanded their broad deep-green leaves, and grew vigorously, in the dry sandy soil, in a very severe and long-continued drouth. It was soon evident that the deepest plowed portion had the advantage; the stems and branches of its plants were stronger, and they first covered the ground.

The potatoes were lifted in the last week of October, when it was found that the land plowed twelve inches deep produced fifty-seven bolls per acre, and the land plowed eighteen inches deep produced sixty-nine bolls per acre, being a difference of twelve bolls per imperial acre, of four cwt. to the boll.

It is a condition annexed to the premium offered by the Highland and Agricultural Society for experiments in deep plowing, that one-half of the land used "shall be cultivated in the ordinary way." By evidence before the Agricultural Committee in 1836, the depth of plowing in this country is from *six* to *nine* inches. If that depth had been taken for the lowest extreme in this experiment, the difference in the production of the two portions, it is believed, would have been greater; but as this field had been plowed *twelve* inches deep for years, its ordinary depth was adhered to, and the difference is certainly sufficient to establish the advantage of deep plowing.

As to the quality, it is excellent for the season from both portions of the land, and in that respect there is no difference. The potatoes from the deep tillage were larger, more of one size, had fewer small ones, and not so many of a green color as those from the other division.

The quantity on the deep tillage is eighty-seven bolls per Scots acre, which is a good crop for any year; and it will readily be granted that it is far above the average of the district this year, many fields not producing half a crop.—A superiority so striking must, therefore, be ascribed to deep culture, being on both portions deeper than ordinary, which furnished moisture in a very dry and scorching season to a sandy soil, and raised its produce above that of richer lands. But though this is a great crop for the season, it must have been still greater if the field had been less exposed, as it has no shelter; and three days of very violent wind in the first week of August broke down the plants, which, from their great luxuriance, were then very tender, and checked their growth.

The practical conclusions to be drawn from this experiment are—

First, That deep plowing increases the produce.

Next, That, as both portions of the land used in the experiment were opened up eighteen inches deep by the subsoil plow for crop 1837, the full benefit of that operation is not obtained till the earth so loosened is again plowed up. And the reason is evident; for it is then only that the soil is deepened, by an addition from the subsoil with which it is intermixed, and rendered more fruitful.

Lastly, If deep plowing increases the produce, it increases also the supply of vegetable manure; and a greater portion of manure, added to improved culture, must produce a progressive increase of fertility and of produce.

This experiment was begun on the glebe of Dunbar for the amusement of the reporter, and before he knew that any premium upon the subject was offered by the Highland and Agricultural Society.

BRITISH AGRICULTURAL DISSERTATIONS

APPLICABLE TO AMERICAN HUSBANDRY.

An impression exists, which, considering its nature and effects, may, perhaps, in the worst sense of the word be denominated a prejudice; to wit: that owing to diversity of circumstances, such as difference of climates, forms of government, the price and the rental of land, and the relations between the employer and the employed, in the two countries; little or nothing can be found in *English books*, or discovered in English agricultural practice or implements, which is applicable to American Husbandry, and therefore that little or nothing from that quarter is worthy of being read and patronised by American Farmers.

Acting under a very different impression, we shall draw very largely from English and European works, for what we hope will prove both entertaining and useful to the patrons of the Farmers' Library; but of this, of course, they must be the judges.

We should not, however, deem it expedient to do so, without exercising very great caution, if ours were an imitative people, like the Chinese; but we shall feel that more freedom may be used, and less apprehension felt, of injury, from any oversight of ours, in consideration of the fact that Americans, thanks to the freedom of their government, are of all people the least given to mere *imitation*. No people exercise more freely all the powers of mental investigation into the reasons for what is proposed out of the common track, and the qualities of new things offered for their adoption. It is in that conviction that we shall present frequently to the consideration of our readers, essays and drawings and descriptions of machinery, which have commanded high premiums, in England and Scotland particularly—first subjecting them to critical examination, as to their adaptation to our soil, circumstances and course of cropping; but after all, not much fearing but that the generality of American readers will examine *for themselves*, with capacity to detect, as we before said, any mistake of ours. Sometimes it will happen that we must give something that is obviously inappropriate, for the sake of valuable suggestions, with which such inapplicable matter may be mixed up or connected. But here—and emphatically, we would have it *distinctly understood*, that we shall pass by nothing which may come in our way that American science or experience can suggest or have tested, which appears to be new and worthy of record and dissemination. On the contrary, such suggestions and such experience will always have preference over other matter. But we confess to place no very high estimate upon mere statements of facts and results, unaccompanied with reasons and an accurate statement of all attendant circumstances. We prefer in all cases what is inductive to what is merely empirical.

Mistaken or not, in thus drawing freely and often from the fountains and stores of European science and experience, we shall at least have the satisfaction to know that in this we shall be standing somewhat aside from the path of fellow laborers whose judgment we have been accustomed to respect, and whose way we have no right, much less any inclination or power, to obstruct.

Imperfect as may be our view of the real wants of American agriculturists, it seems to us that much, amounting to repetition if not repletion, has been said of the practical details and the measured results of experiments in the cultivation of particular crops, the weight to which beasts may be pampered, and of the trial of various implements, with, or without a view to premiums.

We have been told, and usefully told, it is readily admitted, that A, from a specified quantity and kind of corn or wheat, planted or sowed in a particular manner, has gathered a certain large quantity of grain per acre—and that B has fatted and slaughtered a bullock, sheep, or hog, of his favorite breed, that at a certain age attained such and such an extraordinary weight.

Now all this is very useful in its way, and commendable, as it shows how much can be accomplished, in the way of heavy *crops*; while as to *animals*, it demonstrates the difference of breed; proving that some are endowed with aptitude to take on fat at an early age; while others are of slower growth. That the former may be the better for rich pastures and the butcher, while the latter may be preferable for the dairy, for scanty herbage, and finally for the table. All these facts may be again, as they have been repeatedly demonstrated; but to our comprehension of the true wants of agriculture, in the existing condition and circumstances of that

great pursuit in this country; there needs now to be more said of *its philosophy*—of the *principles which control and explain its results.*

"Hang up Philosophy,
Unless Philosophy can make a Juliet."

Well, if Agricultural Philosophy can't make a Juliet, it can make a much more useful personage—for it can instruct the thrifty house-wife how to manage her Dairy, in such manner as to obtain the greatest quantity of butter, and so to prepare it that it will keep the longest time. All this we hope to show her, if she will keep, on her own bunch, the key of her husband's "FARMERS' LIBRARY." That same Philosophy, which is but another word for knowledge, will teach her too—with the aid of Mr. WILDER and Mr. TESCHEMAKER, of Boston—how best to manage her choicest fruits and flowers. And after all, no man, no *husbandman*, can prosper *against* the will of the house-wife—for as old father Tasser quaintly says:

"Take weapon away, of what force is a man?
Take huswife from husband, and what is he than?
As lovers desireth together to dwell,
So husbandry loveth good huswifery well;
Though husbandry seemeth to bring in the gains,
Yet huswifery labors seem equal in pains.
Some respite to husbands the weather may send,
But huswives' affairs have *never an end!*"

Heaven bless them, who would not turn aside to do them a good turn? But——

It is this *rationale* of the Farmer's pursuit, the *why* it is thus and so, that will reveal to him how he may best circumvent the certainly exhausting effects of continued demands upon his land, operating in fearful coincidence with dear labor and low prices, and it is in a great measure from foreign publications that we hope to supply him with these necessary lights. Why, even in England, one of the very last writers on the utility of a more extended application of chemical analysis to Agriculture, says that this art has there of late years assumed an entirely new character! Most chemists, he adds, "have turned their attention to it, and now farmers are content to listen to the suggestions of scientific men, in explaining that which before was thought a mystery."

It is not, by any means, that we have not among us the men of learning prepared to instruct the young farmer in all the natural science connected with his occupation, but who has a right to expect such men to come before they are called? In England, says the writer already referred to, the Royal Agricultural Society, patronised by the Government, have been the chief instruments in effecting the wonderful reformation which agriculture is undergoing. That Society have "*authorized the delivery of lectures* by men of great talent (Doctor Daubeny, Professor Playfair, &c.,) which lectures have been attended by *great bodies of farmers*; rewards have been given, and are still held out by this Society, for *original papers on manures and other subjects, requiring a knowledge of Chemistry on the part of the writer,*"—and these are *the papers*, among others, that will be transferred from foreign journals to the pages of this, the American "FARMERS' LIBRARY." Who doubts that with equal, or with any moderate encouragement we might have lectures and papers equally valuable, from our "AGRICULTURAL ASSOCIATION" in New-York; the "VIRGINIA STATE AGRICULTURAL SOCIETY," and others existing and that would come into existence under genial influences, as naturally as

"The snow drop marks the Spring's approach."

Let but the demand for agricultural science be created and the supply will follow to meet it as surely in this as in mechanical and other pursuits. But the other day, in execution of an act of Congress, some Post-Office letter scales were demanded, and in a few weeks more than 80 competitors presented themselves, each with his own cunning contrivance, to show how unparalleled in the world, is the untrammeled ingenuity of our countrymen when stimulated by the hope of adequate recompense. But when will our government imitate the example of what is good even in despotisms, and offer high rewards for agricultural improvement? Is it for the agricultural reformer that our *Republican* government provides the glittering badge of power and distinction—the high pay, and the life salary? Is it for the plodding discoverer in the peaceful arts, men who beggar their families and destroy their health in civil service, that it provides magnificent quarters for the robust, and hospitals for the sick? In the absence then of all government encouragement let countenance be given to individual exertions, and societies be formed to spread light on the field of Husbandry. It demands delights and flourishes in the light of science as much as in the light of the sun; and we are not altogether deficient in men capable of reflecting it. It is the taste—the conviction of the necessity, that is needed. Only advertise the play, fill the house, and lift the curtain, and our lives upon it we shall not be long before we have the actors coming on the stage. Here we have our Mercantile and Mechanical, our Medical and Law Institutes, with their immense Libraries, stored with appropriate instruction on every imaginable branch or problem connected with mechanical philosophy, with commercial pursuits and the sciences of medicine and law, and why *should the Farmer alone be without his Library and his Literature?* The Farmer, whose occupation, when understood and followed as any man should wish his son to understand and follow it, demands some acquaintance with Botany—the culture of trees, with mineralogy—with chemistry, with entomology or the knowledge

of insects and all the branches of Natural History—unless indeed they are content to remain, and have their sons remain mere ignoble imitative clod-hoppers. Once more we repeat that it is the taste that is wanting. Be it then our pleasing duty, with a feeble hand but willing heart, to assist many and more able fellow-laborers in begetting such a taste; and how can that be better done than by laying hold of the best means within our reach, among which we regard these philosophical disquisitions, such as we find, already to our hand, in these foreign weekly, monthly, and quarterly Agricultural Journals. Disquisitions illustrated and supported for the most part, by all the details of actual experiments, and all the analogical circumstances necessary to intelligible and fair comparison and deduction? Is there any reason why we, who cater for the agricultural, should be less elert, than he who panders to the gastronomical appetite? Which is most useful, to pamper the cravings of him whose hunger is for knowledge; or to go abroad for dainties and fashions to humor the caprices of the glutton or the fop?

Such at least are our views of some of the wants of American agriculture, at this time; and of our duty and our means to supply them. Whether, what we shall offer, of articles thus imported, deserves to be encouraged, until an improving taste shall hold out encouragement sufficient to insure their domestic production, is a question for our readers to decide. Our liberal publishers tell us to go ahead and make a fair experiment. If it fail it shall not be for want of industry, and of heartfelt anxiety for the prosperity of the interest to which we hope to devote the residue of a life spent, we assuredly may say, in no feeling of indifference to the honor and welfare of American Agriculture. Having thus explained how we hope to benefit the cause of American Husbandry, by the publication of the best essays from abroad, for many of which, written by men of the highest reputation, large premiums are paid, we proceed now, with pleasure, to show our preference for domestic production when of superior quality, by giving place to one which obtained the premium from the New-York State Agricultural Society which ought, of itself, to be sufficient to give it the stamp of excellence—but which over the signature it bears, would sufficiently commend itself to our attention and its author to our thanks.

ON FARM MANAGEMENT.

PRIZE ESSAY—BY J. J. THOMAS.

THE great importance of performing in the best manner, the different operations of agriculture, is obvious to every intelligent mind, for on this depends the success of farming. But a good performance of single operations merely, does not constitute the best farmer. The perfection of the art, consists not only in doing everything well, individually, but in a proper adjustment and systematic arrangement of all the parts, so that they shall be done, not only in the best manner and at the right time, but with the most effective and economical expenditure of labor and money. Every thing must move on with clock-work regularity, without interference, even at the most busy seasons of the year.

As this subject includes the whole routine of farming, in a collected view, as well as in its separate details, a treatise upon it might be made to fill volumes; but this being necessarily confined to a few pages, a general outline, with some remarks on its more essential parts, can only be given.

CAPITAL.—The first requisite in all undertakings of magnitude, is to "count the cost." The man who commences a building, which to finish would cost ten thousand dollars, with a capital of only five thousand, is as certainly ruined, as many farmers are, who, without counting the cost, commence on a scale to which their limited means are wholly inadequate. One of the greatest mistakes which young farmers make in this country, in their anxious wish for large possessions, is, not only in purchasing more land than they can pay for, but in the actual expenditure of all their means, without leaving any even to *begin* the great work of farming. Hence, the farm continues for a long series of years poorly provided with stock, with implements, with manure, and with the necessary labor.—From this heavy drawback on the profits of his land, the farmer is kept long in debt; the burthen of which not only disheartens him, but prevents that enterprise and energy which are essential to success. This is one fruitful reason why American agriculture is in many places in so low a state. A close observer, in traveling through the country, is thus enabled often to decide from the appearances of the buildings and premises of each occupant, whether he is in or out of debt.

In England—where the enormous taxes of different kinds, imperiously compel the cultivator to farm well, or not farm at all—the indispensable necessity of a heavy capital to begin with, is fully understood. The man who merely *rents* a farm there must possess as much to stock it and commence operations, as the man who *buys* and pays for a farm of equal size in the best parts of western New-York. The result is, that he is enabled to do every thing in the best manner; he is not compelled to bring his goods prematurely to market, to supply his pressing wants; and by having ready money always at command, he can perform every operation at the very best season for product and economy, and make purchases, when necessary, at the most advantageous rate. The English farmer is thus able to pay an amount of tax, often more than the whole product of farms of equal extent in this country.

The importance of possessing the means of doing every thing at exactly the right season, cannot be too highly appreciated. One or two illustrations may set this in a clearer light. Two farmers had each a crop of ruta-bagas, of an acre each. The first, by hoeing his crop early, while the weeds were only an inch high, accomplished the task with two days work, and the young plants then grew vigorously and yielded a heavy return. The second, being prevented by a deficiency of help, had to defer his hoeing

one week, and then three days more, by rainy weather, making ten days in all. During this time, the weeds had sprung up six to ten inches high, so as to require, instead of two days, no less than six days to hoe them; and so much was the growth of the crop checked at this early stage, that the owner had 150 bushels less on his acre, than the farmer who took time by the forelock. Another instance occurred with an intelligent farmer of this State, who raised two fields of oats on land of similar quality. One field was sown very early and well put in, and yielded a good profit. The other was delayed twelve days, and then hurried; and although the crop was within two-thirds of the amount of the former, yet that difference was just the clear profit of the first crop; so that with the latter, the amount yielded only paid the expenses.

Admitting that the farm is already purchased and paid for, it becomes an object to know what else is needed, and at what cost, before cultivation is commenced. If the buildings and fences are what they should be, which is not often the case, little immediate outlay will be needed for them. But if not, then an estimate must be made of the intended improvements and the necessary sum allotted for them. These being all in order, the following items, requiring an expenditure of capital, will be required on a good farm of 100 acres of improved land, that being not far from the size of a large majority in this State. The estimate will of course vary considerably with circumstances, prices, &c.

1. Live Stock.

The amount will vary with the fertility and products of the land, its quality, and situation with regard to market. The following will approximate the average on good farms, taken at the spring of the year, or commencement of work:

3 horses, at $80	$240
1 yoke oxen	75
8 milch cows, at $15	120
10 steers, heifers and calves	70
20 pigs, at $3	60
150 sheep, at $2	300
Poultry, say	5
Total	$870

2. Implements.

2 plows, fitted for work	$20 00
1 small plow, do	6 00
1 cultivator, best kind	7 00
1 drill barrow	5 00
1 roller	5 00
1 harrow	10 00
1 fanning mill	20 00
1 straw cutter	15 00
1 root slicer	8 00
1 farm wagon, with hay rack, &c	70 00
1 ox-cart	50 00
1 horse-cart	45 00
1 double farm-harness	30 00
1 horse-cart harness	18 00
1 root-steamer, or boiler	20 00
1 shovel and one spade	2 50
3 steel-plate hoes	2 25
2 dung forks	2 25
3 hay forks	3 00
2 hand rakes	0 25
1 revolving horse-rake	8 00
2 grain cradles	8 00
2 scythes	4 00
1 wheelbarrow	4 00
1 pointed shovel	1 25
1 grain shovel, or scoop-shovel	1 25
1 pick	1 50
1 mall and wedges	2 50
2 axes	4 00
1 hammer	0 50
1 wood-saw	1 50
1 turnip-hook	0 75
1 hay-knife	3 00
2 apple-ladders, (for gathering,)	1 50
2 large baskets	1 25
2 hand baskets	0 50
1 tape-line, (for laying off land,)	2 00
2 sheep-shears	2 00
1 grindstone	3 00
1 steelyard, large, and one small	2 00
1 stable-lantern	0 50
1 currycomb, one brush	0 75
1 half-bushel measure	1 00
20 grain-bags	8 00
1 ox-chain	3 00
1 crowbar	2 00
1 sled and fixtures	30 00
Total	$437 00

Other articles might be included, as subsoil plow, sowing machine, &c. A thrashing machine is not named, as it is better to employ itinerant thrashers, and save capital. To the preceding amount ought to be added one-tenth the expense of fencing the farm, as fences need renewing at least once in ten years. Every farmer should also be supplied with a small set of carpenter's tools, which would cost about twelve dollars, for repairing implements in rainy weather, and other useful purposes. This set should include saw, hammer, augers, planes, adz, mallet, chisels, square, breast-bits, &c., and by the convenience and economy afforded, would soon repay their cost.

3. Seeds.

2½ bush. clover seed,	for	10	acres	$15 00
2 " corn,	"	6	"	1 00
30 " potatoes,	"	2	"	7 00
3 lbs. ruta baga seed,	"	1	"	1 50
2 " field beet "	"	½	"	1 00
2 " carrot "	"	½	"	1 00
30 bush. seed wheat,	"	20	"	30 00
10 " oats,	"	5	"	2 50
10 " barley,	"	5	"	4 00
Total				$63 00

4. Labor.

Supposing the owner to labor with his own hands, as every owner should, so far as is consistent with a general superintendence of all parts, which would probably amount to one-half the time,—he would need besides through the season two men and one boy, and in the winter one man; during haying and harvest he would require two additional hands. The men, boarding themselves, could be had for fifteen dollars per month in summer, and twelve in winter; if boarded, the cost of their meals would make up the deficiency in wages to the same amount.—The expenditure needed then, would be,

2 hired men 8 months, 15 per month	$240 00
1 " boy " 6 "	48 00
Day labor in harvest	32 00
Total	$320 00

5. Maintenance of Animals.

Cattle and sheep would need hay till fresh pasture, and horses hay, and also a good supply of oats till after harvest. All would be benefited by a liberal feeding of roots, including swine. The amount of all these supplies needed, would be about

7 tons of hay	$42 00
200 bushels of oats	50 00
400 " roots	50 00
Total	$142 00

RECAPITULATION.

Live stock	$870 00
Implements	437 00
Seeds	63 00
Labor	320 00
Maintenance of Animals	142 00
Total	$1,832 00

The amount of capital needed the first year, in stocking and conducting satisfactorily the operations of one hundred acres of improved land, several items being doubtless omitted.

If this is a larger sum than the young farmer can command, let him purchase only fifty acres, and reserve the rest of the purchase money which would be needed for the 100 acres, to commence with on the smaller farm; and he will scarcely fail to make more, than on a larger, with every part subjected to an imperfect hurrying, and irregular management. He may calculate perhaps on the returns of his crops in autumn, at least to pay his hands. But he must remember that the first year of farming is attended with many expenses which do not usually occur afterwards; which his crops may not repay, besides supporting his family and paying his mechanic's and merchant's bills. The first year must always be regarded with uncertainty; and it is better to come out at the end, on a moderately sized farm, well tilled, and in fine order, with money in pocket, than on a larger one, in debt; and hired hands, a class of men not to be disappointed and who ought not to be, waiting for their pay. There are a far greater number of farmers embarrassed and crippled by placing their estimates of expenses too low, than of those who swing clear and float freely by a full previous counting of cost.

Size of Farms.—After what has just been said, the cultivator will perceive in part the advantages of moderately sized farms for men in moderate circumstances. The great disadvantage of a superficial, skimming culture, is obvious with a moment's attention. Take the corn crop as an illustration. There are a great many farmers to my certain knowledge, whose yearly product per acre does not exceed an average of twenty-five bushels. There are other farmers whom I also well know, who obtain *generally* not less than sixty bushels per acre, and often eighty to ninety-five. Now observe the difference in the profits of each. The first gets 250 bushels from ten acres. In doing this, he has to plow ten acres, harrow ten acres, mark out ten acres, find seed for ten acres, plant, cultivate, hoe, and cut up ten acres, besides paying the interest on ten acres, worth from three to five hundred dollars. The other farmer gets 250 bushels from four acres at the farthest; and he only plows, plants, cultivates, and hoes, to obtain the same amount, four acres, which from their fine tilth and freedom from grass and weeds, is much easier done, even for an equal surface. The same reasoning applies throughout the farm.—Be sure then, to cultivate no more than can be done in the best manner, whether it be ten, fifty, or five hundred acres. A friend who owned a four hundred acre farm, told me that he made less than his next neighbor, who had only seventy-five. Let the man who applies a certain amount of labor every year to his farm, reduce its dimensions until that labor accomplishes everything in the very best manner. He will doubtless find that the amount of land will thus become much smaller than he supposed, more so than most would be willing to reduce it; but on the other hand, the nett proceeds from it will augment to a greater degree than perhaps could possibly be believed.

But let me not be misunderstood. Large farms are by no means to be objected to, provided the owner has capital enough to cultivate every part as well as some of our best small ones are cultivated.

As an example of what may be obtained from a small piece of land, the following products of fifty acres are given, and are not more than I have known repeatedly to be taken from good land by several thorough farmers:

10 acres	wheat,	35 bush.	per acre,	at $1.00,	$350
5 "	corn,	90 "	"	.40,	180
2 "	potatoes,	300 "	"	.20,	120
1 "	ruta-bagas,	800 "	"	.10,	80
6 "	wint. apples,	250 "	"	.25,	375
6 "	hay,	2½ tons	"	6.00	90
10 "	pasture, worth				60
5 "	barley,	40 bush.	"	.40	80
5 "	oats,	50 "	"	.20	50
Total products of fifty acres of very fine land,					$1,385

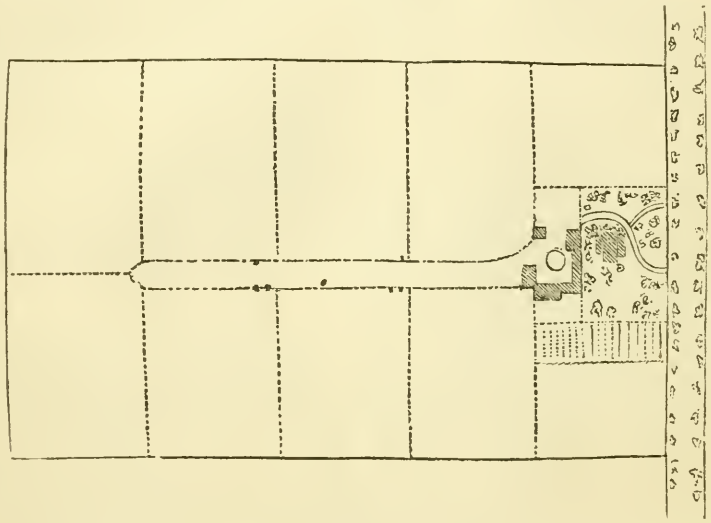
This aggregate yield is not greater than that obtained by some who might be named from a similar quantity of land. Good land could be brought to that state of fertility very easily at a total cost of one hundred dollars per acre, and then it would be incomparably cheaper than many large poor farms at nothing; for while the fifty acres could be tilled for three hundred and eighty-five dollars, leaving one thousand dollars nett profits, large poor farms hardly pay the work spent upon them. One proprietor of such a farm declared—"It takes me and my hired man all summer at hard work to get enough to pay him only."

Laying out Farms.—This department is very much neglected. The proper disposition of the different fields, for the sake of economy in fencing, for convenience of access, and for a full command of pasture and protection of crops at all times, has received comparatively little attention from our agricultural writers and from farmers.

Many suppose that this business is very quickly disposed of; that a very few minutes, or hours at most, will enable a man to plan the arrangement of his fields about right. But this is a great error. Even when a farm is of the simplest form, on a flat uniform piece of ground, many things are to be borne in mind in laying it out. In the first place, we all know that the *fencing* of a moderately sized farm costs many hundred dollars. It is very desirable to do it well, and use at the same time as little material as possible. To do this much will depend on the shape of the fields. A certain length of fence will enclose more land in the form of a *square*, than in any other practicable shape. Hence fields should approach this form as nearly

as possible. Again, the disposition of lanes is a matter of consequence, so as to avoid unnecessary length and fencing, and occupy the least quantity of ground.

But these rules may be materially affected by other considerations. For instance, it is very desirable that land of similar quality may be in the same enclosure. Some may be naturally too wet for any thing but meadow or pasture; some may be much *lighter*, and susceptible of plowing, while others are not; some may be naturally sterile, and need unusual manuring, with green crops. All these should, as far as practicable, be included each in its own separate boundary. The situation of surface-drains, forming the boundaries of fields, may influence their shape; facilities for irrigation may have an essential bearing; convenience for watering cattle is not to be forgotten. Where, in addition to all these considerations, the land is hilly, still more care and thought is required in the subdivision, which may possibly require years of experience; but where fixed fences are once made, it is hard to remove them; hence a previous thorough examination should be made. A farm road, much used for heavy loads, should be made hard and firm, and cannot be easily altered; it should consequently be exactly in the right place, and be dry, level and short—the shape of adjoining fields even conforming to these requisitions; but a road little used should not interfere with the outlines of fields.



A specimen of laying out a farm is given in the preceding plan. It is of the very simplest kind, or a right-angled parallelogram, on nearly level land—a form that often occurs. It lies on one side of a public road, which is lined with forest trees. The middle enclosure on the road contains the dwelling, the barn, and other outbuildings. It is planted with trees for shade, ornament, and domestic enjoyment—not set "all in a row," but in the graceful or picturesque style which distinguishes a beautiful natural landscape. On one side are the fruit, kitchen, and flower gardens—the lot containing them being oblong, to separate certain portions of the fruit garden for *pigs*—the sovereign remedy for the curculio; the orchard may occupy the lot adjoining. The remainder of the farm is divided into fields nearly square, each being entered from the lane by a good gate. These fields may be increased or lessened in size without altering the position of the lane. They should always be sufficiently numerous to admit a good rotation, and to separate at all times the pasture from the tillage land.

In laying out a farm with a very uneven surface, or irregular shape, it would be best to draw, first, a plan adapted to smooth ground, as the one just given; and then vary the size and shape of the fields, the distance of the lane from the centre, its straightness, &c., according to the circumstances of the case.

Fences.—The kind of fence used, and the material for its construction, must depend on circumstances and localities. A good fence is always to be preferred to an imperfect one; though it cost more, it will more than save that cost, and three times the amount in vexation besides, by keeping cattle, colts, and pigs out of fields of grain. A thriving farmer, whose whole land, except a small part with stone wall, is enclosed by common rail fence, with upright cedar stakes and connecting caps at the top, finds that it needs renewing once in six years. He accordingly divides his whole amount of fences into six parts, one of which is built new every year. All is thus kept systematically in good repair. Stone walls, if set a foot below the surface to prevent tumbling by frost, are the most durable fence. Hedges have not been sufficiently tried. The English hawthorn is not well adapted to our hotter and drier climate; and though sometimes doing well for a time, is not to be depended on. The buckthorn in New-England, and the Newcastle and Washington thorns in Pennsylvania and Delaware, have succeeded finely.

Gates.—Every field on the farm should be entered by a good self-shutting and self-fastening

gate. A proper inclination in hanging will secure the former requisite, and a good latch, properly constructed, the latter. Each field should be numbered, and the number painted on the gate-post. Let the farmer who has *bars* instead of gates, make a trial of their comparative convenience, by taking them out and replacing them without stopping, as often as he does in one year on his farm, say about six hundred times, and he cannot fail to be satisfied which is the cheapest for use.

Buildings.—These should be as near the centre of the farm as other considerations will admit. All the hay, grain, and straw, being conveyed from the fields to the barn, and most of it back again in manure, the distance of drawing should be as short as possible. This will, also, save much traveling of men and of cattle, to and from the different parts of the farm. The buildings should not, however, be too remote from the public road; and a good, dry, healthy spot should be chosen. The dwelling should be comfortable but not large—or it should, rather, be adapted to the extent of the lands. A large, costly house, with small farm and other buildings, is a bad indication of management. The censure of the old Roman should be avoided, who, having a small piece of land, built his house so large that he had less occasion to plow than to sweep.

The barn and out-buildings should be of ample extent. The barn should have space for hay, grain, and straw. It is a matter of great convenience to have the straw for littering stables, housed, and close at hand, and not out of doors, under a foot of snow. There should be plenty of stables and sheds for all domestic animals. This provision will not only save one-third of the fodder, but stock will thrive much better. Cows will give much more milk—sheep will yield more and better wool—and all will pass through the winter more safely. The wood-house near, or attached to the dwelling, should never be forgotten, so long as comfort in building fires, and economy in the use of fuel, are of any importance.

A small, cheap, moveable horse-power should belong to every establishment, to be used in churning, sawing wood, driving washing machine, turning grindstone, cutting straw, and slicing roots.

There should be a large root cellar under the barn, into which the cart may be *dumped* from the outside. One great objection to the culture of ruta-bagas and beets, in this country,—the difficulty of winter keeping,—would then vanish.

Both barn and house cellars should be well coated on the bottom and sides, with water-lime-mortar; which is a very cheap and effectual way to exclude both water and rats.

Choice of Implements.—Of those which are much used, the very best only should be procured. This will be attended with a gain every way. The work will be easier done and it will be better done. A laborer who, by the use of a good hoe for one month, can do one quarter more each day, saves, in the whole time, an entire week's labor.

Choice of Animals.—The best of all kinds should be selected, even if costing something more than others. Not "*fancy*" animals, but those good for use and profit. Cows should be productive of milk, and of a form adapted for beef; oxen, hardy, and fast-working; sheep, kept fine by never selling the best; swine, not the *largest* merely, but those fattening best on least food. A Berkshire, at 200 pounds, fattened on 10 bushels corn, is better than a "land pike" of 300 fattened on 50 bushels.

Having now taken some notice of the necessary items for commencing farming, it remains to glance a little at

SOILS AND THEIR MANAGEMENT.

Soils are of various kinds, as heavy and light, wet and dry, fertile and sterile. They all require different management, in a greater or less degree.

Heavy soils are often stronger and more productive than light; but they require more labor for pulverization and tillage. They cannot be plowed when very wet, nor so well when very dry. Although containing greater or less portions of clay, they may be distinguished, as a class, from lighter soils, by the cloddy surface the fields present after plowing in dry weather; by their cracking in drouth; and by their adhesiveness after rains.

Sandy and gravelly loams, also contain clay, but in smaller quantity; so that they do not present the cloddiness and adhesiveness of heavy soils. Though possessing generally less strength than clay soils, they are far more easily tilled, and may be worked without difficulty in wet weather; they do not crack or bake in drouths. Indian corn, ruta-bagas, and some other crops, succeed best upon them. Sandy soils are very easily tilled, but are generally not strong enough. When made rich, they are fine for some succulent crops.

Peaty soils are generally light and free, containing large quantities of decayed vegetable matter. They are made by draining low and swampy grounds. They are fine for Indian corn, broom corn, barley, potatoes, and turnips. They are great absorbers, and great radiators of heat; hence they become warm in sunshine, and cold on clear nights. For this reason they are peculiarly liable to frosts. Crops planted upon them must, consequently, be put in late—after spring frosts are over. Corn should be of early varieties, that it may not only be planted late, but ripen early.

Each of these kinds of soil may be variously improved. Most of heavy soils are much improved by draining; open drains to carry off the surface water, and covered drains, that which settles beneath. An acquaintance covered a low, wet, clayey field with a net work of underdrains, and from a production of almost nothing but grass, it yielded the first year forty bushels of wheat per acre—enough to pay the expense; and admitted of much easier tillage afterwards. Heavy soils are also made lighter and freer by manuring; by plowing under coatings of straw, rotten chips, and swamp muck; and in some rare cases, by carting on sand—though this is usually too expensive for practice. Subsoil plowing is very beneficial, both in wet seasons and in drouth; the deep, loose bed of earth it makes, receiving the water in heavy rains, and throwing it off to the soil above, when needed. But a frequent repetition of the operation is needed, as the subsoil gradually settles again.

Sandy soils are improved by manuring, by the application of lime, and by frequently turning in green crops. Leached ashes have been found highly beneficial in many places. Where the subsoil is clayey, which is often the case, and especially if marly clay—great advantage is derived from shoveling it up and spreading it on

the surface. A neighbor had twenty bushels of wheat per acre on land thus treated, while the rest of the field yielded only five.

MANURES.—These are first among the first of requisites in successful farm management. They are the strong moving power in agricultural operations. They are as the great steam engine which drives the vessel onward. Good and clean cultivation is, indeed, all-important; but it will avail little without a fertile soil; and this fertility must be created, or kept up, by a copious application of manures. For these contribute directly, or assist indirectly, to the supply of nearly all the nourishment which plants receive; it is these, which, produced chiefly from the decay of dead vegetable and animal matter, combine most powerfully to give new life and vigor; and thus the apparently putrid mass, is the very material which is converted into the most beautiful forms of nature; and plants and brilliant flowers spring up from the decay of old forms, and thus a continued succession of destruction and renovation is carried on through an unlimited series of ages.

Manures possess different degrees of power, partly from their inherent richness, and partly from the rapidity with which they throw off their fertilizing ingredients, in assisting the growth of plants. These are given off by solution in water, and in the form of gas; the one as liquid manure, which, running down, is absorbed by the fine roots; and the other as air, escaping mostly into the atmosphere, and lost.

The great art, then, of saving and manufacturing manure, consists in retaining and applying to the best advantage, these soluble and gaseous portions. Probably more than one-half of all the materials which exist in the country, are lost, totally lost, by not attending to the drainage of stables and farm yards. This could be retained by a copious application of straw; by littering with saw-dust, where saw-mills are near; and more especially by the frequent coating of yards and stables with dried peat and swamp muck, of which many parts of our State furnish inexhaustible supplies. I say *dried* peat or muck, because if it is already saturated with water, of which it will often take in five-sixths of its own weight, it cannot absorb the liquid portions of the manure. But if it will absorb five-sixths in water, it will, when dried, absorb five-sixths in liquid manure, and both together form a very enriching material. The practice of many farmers, shows how little they are aware of the hundreds they are every year losing by suffering this most valuable of their farm products to escape. Indeed, there are not a few who carefully, and very ingeniously, as they suppose, place their barns and cattle yards in such a manner on the sides of hills, that all the drainage from them may pass off out of the way into the neighboring streams; and some one mentions a farmer, who, with preëminent shrewdness, built his hog pen directly across a stream, that he might at once get the cleanings washed away, and prevent their accumulation. He of course succeeded in his wish; but he might, with almost equal propriety, have built his granary across the stream, so as to shovel the wheat into the water when it increased on his hands.

The loss of manure by the escape of gas is often very great. The proof of this was finely exhibited by Humphrey Davy, in an experiment, performed by filling a large retort from a heap of fermenting manure, placing the beak among the roots of some grass. Nothing but vapor left the vessel, yet in a few days the grass exhibited greater luxuriance round the beak of the retort than any of the surrounding portions. Hence the superiority of unfermented manure—the rich portions are not yet lost. And hence, too, the importance of preventing this loss by an immediate application and plowing into the soil, and also by mixing it in composts with muck, peat, swamp mud, and even common earth in a dry state,—and of preventing its escape from stables and yards, by a daily strewing with dried peat, lime or plaster.

The superiority of unfermented manure has just been mentioned, which is by many doubted. But the very facts on which these doubts rest, only prove its efficacy. For, they say, "I have always found fresh manure to be attended with little effect the first year, while it yet remains fresh; but afterwards, when fermentation and decay had taken place, the benefit was great and striking." But here is the proof at hand, that not until the rich, soluble and gaseous parts had well penetrated and been absorbed by the soil, was their powerful and invigorating influence exerted upon the growing plants. Fresh manure is generally in a state not readily mixed with soils; it is thrown into large lumps over the surface, some of which are plowed in and others not, but none of them prove of immediate use to the crops. But on the other hand, fermented manure, from its ready pulverization, admits of an easy admixture. Let fresh manure be thoroughly ground down and worked into the soil by repeated harrowings, and two or three plowings, and its influence will be like magic.

Swamp muck has often been spoken of as manure. But those who expect great and striking results from its application, will be disappointed, as the writer has been. Even with ashes, it is much less powerful than stable manure, not only because it possesses less inherent richness, but because it has less soluble parts, and consequently imparts its strength more slowly to growing plants. But this quality only makes it the more enduring. By decoction in water, vegetable mold loses a small portion of its weight by solution; but if the remaining insoluble portion is exposed to air and moisture a few months, another part may be again dissolved. Thus, peat, muck and all decayed vegetable fibre, becomes a slow but lasting source of nourishment to plants.

But it is, when shoveled out and dried, to be mixed with farm-yard manure, as a recipient for its evanescent parts, that peat or muck becomes preëminently valuable. Some parts of the State abound with inexhaustible supplies in almost every neighborhood; many land owners have from twenty to a hundred thousand cubic yards on their farms, lying untouched, while half-starved crops are growing in the adjacent fields. There are whole counties so well supplied with it, that if judiciously applied, it would doubtless double their aggregate products.

All neat farming, all profitable farming, and all satisfactory farming, must be attended with a careful saving of manures. The people of Flanders have long been distinguished for the neatness and excellence of their farms, which they have studied to make like gardens. The care with which they collect all refuse materials which may be converted into manure and increase their composts, is one of the chief reasons of the cleanliness of their towns and resi-

dences. And were this subject fully appreciated and attended with a corresponding practice generally, it would doubtless soon increase by millions the agricultural products of the State.

But there is another subject of scarcely less magnitude. This is a systematic

ROTATION OF CROPS.—If manuring is the steam engine which propels the vessel, rotation is the rudder which *guides* it in its progress.—Unlike manuring, rotation does not increase the labor of culture; it only directs the labor in the most effective manner, by the exercise of judgment and thought.

The limits of this paper do not admit of many remarks on the principles of rotation. The following courses, however, have been found among some of the best adapted to our State:

I..1st *year*—Corn and roots well manured;
2d *year*—Wheat, sown with clover seed, 15 lbs. per acre;
3d *year*—Clover, one or more years, according to fertility and amount of manure at hand.

II..1st *year*—Corn and roots, with all the manure;
2d *year*—Barley and peas;
3d *year*—Wheat, sown with clover;
4th *year*—Clover, one or more years.

III..1st *year*—Corn and roots, with all the manure;
2d *year*—Barley;
3d *year*—Wheat, sown with clover;
4th *year*—Pasture;
5th *year*—Meadow;
6th *year*—Fallow;
7th *year*—Wheat;
8th *year*—Oats, sown with clover;
9th *year*—Pasture, or meadow.

The number of fields must correspond with the number of the changes in each course; the first needing three fields to carry it out, the second four, the third nine. As each field contains a crop each, in the several successive stages of the course, the whole number of fields collectively comprise the entire series of crops every year. Thus in the last above given, there are two fields of wheat growing at once, three of meadow and pasture, one of corn and roots, one of barley, one of oats, and one in summer fallow.

OPERATIONS IN THE ORDER OF TIME.—The vital consequence of doing every thing at the right season, is known to every good farmer.—To prevent confusion and embarrassment, and keep all things clearly and plainly before the farmer at the right time, he should have a small book to carry in his pocket, having every item of work for each week, or each half month, laid down before his eyes. This can be done to the best advantage to suit every particular locality and difference of climate, by marking each successive week in the season at the top of its respective page. Then as each operation severally occurs, let him place it under its proper heading; or, if out of season, let him place it back at the right time. Any proposed improvements can be noted down on the right page. Interesting experiments are often suggested in the course of reading or observation, but forgotten when the time comes to try them. By recording them in such a book under the right week, they are brought at once before the mind. Such an arrangement as this will prevent a great deal of the confusion and vexation too often attendant on multifarious cares, and assist very essentially in conducting all the farm work with clock-work regularity and satisfaction.

In reviewing the various items which are most immediately essential to good farm management, some of the most obvious will be—capital enough to buy the farm and to stock it well; to select a size compatible with these requisites; to lay it out in the best manner; to provide it well with fences, gates, and buildings; to select the best animals and the best implements to be had reasonably; to bring the soil into good condition, by draining, manuring, and good culture; to have every part under a good rotation of crops; and every operation arranged, so as all to be conducted systematically, without clashing and confusion. An attention to all these points would place agriculture on a very different footing from its present condition in many places and with most farmers. The business then, instead of being repulsive, as it so frequently is, to our young men, would be attended with real enjoyment and pleasure

But in all improvements, in all enterprises, the great truth must not be forgotten, that success is not to be expected without diligence and industry. We must sow in spring, and cultivate well in summer, if we would reap an abundant harvest in autumn. When we see young farmers commence in life without a strict attention to business, which they neglect for mere pleasure, well may we in imagination see future crops lost by careless tillage—broken fences, unhinged gates, and fields filled with weeds—tools destroyed by heedlessness, property wasted by recklessness, and disorder and confusion triumphant; and unpaid debts, duns, and executions, already hanging over the premises. But, on the other hand, to see cheerful-faced, ready-handed industry, directed by reason and intelligence, and order, energy, and economy, guiding the operations of the farm—with smooth, clean fields, and neat trim fences—rich, verdant pastures, and fine cattle enjoying them, and broad waving meadows and golden harvests, and waste and extravagance driven into exile, we need not fear the success of such a farmer—debts cannot stare him in the face, nor duns enter his threshold.

It is such enterprise as this, that must place our country on a substantial basis. Agriculture in a highly improved state, must be the means, which next to the righteousness which truly exalts a nation, will contribute to its enduring prosperity. All trades and commerce depend on this great art as their foundation. The cultivation of the soil and of plants was the earliest occupation of man; it has in all ages been his chief means of subsistence; it still continues to furnish employment to the great majority of the human race. It is truly the great art of peace, as during wars and commotions it has languished and declined, but risen again in strength and vigor when men have lived at peace with each other—it has then flourished and spread, converted the wilderness into life and beauty, and refreshed and adorned nature with embellished culture. For its calm and tranquil pleasures—for its peaceful and healthful labors—away from the fretful and feverish life of crowded cities,—"in the free air and beneath the bright sun of heaven,"—many, who have spent the morning and noon of their lives in the anxious cares of commercial life, have long sighed for a scene of peace and quietude for the evening of their days.

THE EIGHTEENTH ANNUAL FAIR OF THE AMERICAN INSTITUTE.

We learn with great pleasure that the Institute is already engaged in making preparations for the Fair in October next. Its exertions have been unremitting in the endeavor to give to these Annual assemblages of the improved productions of Agriculture and the Mechanic Arts, every attraction that their high national importance demands. The remarkable ingenuity and ceaseless action of our People gains from year to year with wonderful rapidity. May we not then fairly anticipate a higher treat from the next Fair than we have ever had before? The Institute, unaided and unsustained except by its own energy, had a number of visitors at its last Fair, said to be one-half as great as that of the great Fair of Paris, which is held *but once in five years*—and to which the French Government lends its powerful aid, by causing the whole kingdom to be examined by commissioners, for the selection of the most interesting articles for the exhibition, and *paying the expenses of their transportation to Paris.*

The number of citizens who visited the last Fair of the Institute, was about *two hundred and fifty thousand,* while Paris contains about *three times* the population of New-York.

Niblo's Garden is engaged for the central exhibition. Fields for the plowing and spading matches will be selected, as convenient as possible, for all classes of citizen visitors.

The Cattle Show will be held on the Fifth-avenue at Twenty-third and Twenty-fourth-streets; a spot affording space and convenience for the exhibition and for the visitors. Arrangements are in progress for premiums upon a much larger scale, for high-bred cattle—for fat bullocks—for working oxen—milch cows—for sheep of the best blood—for fat mutton, &c.—and for horses for draft, race, &c., which it is to be hoped will insure an exhibition worthy of the American Institute.

This opportunity for buyers and sellers of fine stock of every sort, should not be overlooked by them. Those who wish to find out without trouble, all collected together, specimens of the best home-made articles of every kind—will have the advantage of seeing them on one spot at the Fair. Inventors will be anxious to examine the results of genius applied to various productions since the last Fair, and to show to thousands their own improved works.

The Institute will give larger premiums than heretofore to a given number of the most new and useful inventions and improvements. During the last year, the Institute has distributed large numbers of new and valuable seeds—and on the condition of receiving a part of their produce for the purpose of further distribution—and some of their products for the Agricultural and Horticultural Exhibition. This will be a guarantee for a grand display.

It is desired to afford every encouragement to the full exertion of that capacity for invention and improvement which has already enabled our Country to compete with all the world in such matters.

One American has, by his genius, increased twenty-fold the Cotton crop of the planting States. Another is remembered by the wonderful success of Steam Navigation, destined to revolutionize the Commerce of the world.—These efforts of the Institute to increase the industry and cherish the genius of our countrymen, ought to stimulate the good feeling, the national pride of every great man who loves his country, to lend his aid in carrying into the fullest execution the noble object in view; and an example is already before us in the exertions of the Sovereigns and Nobles of Europe, which surely cannot be lost upon this Republic. The ambition to surpass them in all the arts which give happiness to mankind should be found strong and enduring.

In the noble competition now existing throughout the civilized world, to foster arts, which it behoves Republics, above all governments, to cherish and protect, America must not allow herself to be outdone.

The third National Convention of Farmers and Gardeners and Silk Culturists is contemplated to meet during the Fair.

The Home Department for Agriculture so earnestly pressed by General Washington, at the last session of Congress under his Administration, will again be a subject of the most serious consideration by the Convention—and every effort will be made to awaken the attention of the Nation to that subject, and also special attention will be paid to the culture of Silk, to enable us as soon as practicable to realize the benefit of another great National Agricultural staple

FALL PLOWING:

UNDER WHAT CIRCUMSTANCES TO BE RECOMMENDED.

ON THE ILL EFFECTS OF PLOWING LAND WHEN WET.

THERE are few points of Husbandry, about which Farmers differ more in practice, than about Fall Plowing; and this difference, like most others, occurs from want of reflection on the *principles* that should govern the particular case—or rather, we might say, from want of knowledge of the principles, or *reasons* involved in every agricultural problem. You shall sometimes see a farmer turning his "glebe" at every odd time he can catch of open weather, in Fall and Winter; while another, his next neighbor, does not strike a furrow; and yet both may be right, for both may have been taught by experience that his system is the better one of the two. But were they to exchange estates, they would, too probably, each carry his practice along with him, because his action had been the result of habit rather than of investigation; and so they would proceed until, after some years of costly experiment, each would find that, in changing his land he should have changed habits also. The truth is, that whether land should be plowed up in autumn and exposed for the melioration to the winter's frost, or whether left undisturbed under whatever coating it may be wearing, depends on various circumstances, and especially on the natural texture and composition of the soil. These circumstances are so well explained in the following Essay, that we have concluded to preserve it in the Journal of Agriculture. The reader will find in it, also, observations that cannot be too well remembered, in reprobation of one of the grossest blunders that a Farmer can commit—that of *plowing his land when wet*. We have long been so well satisfied, from personal observation as well as by the common-sense view of the case, of the very pernicious effect of stirring land when wet, not only on the succeeding crop, but on the land itself—effects from which it sometimes does not entirely recover for years—that we take the first occasion, in a sense of duty, to impress it upon the reader, by the following forcible remarks on it in connexion with winter plowing. The rationale, in both cases, is here made apparent:

HOW TO AFFORD THE NECESSARY SUPPLY OF AIR TO THE ROOTS OF PLANTS.

BY MR. J. MAINE, BROMPTON.

THE breaking up, or turning the surface of cultivated land, either by the plow, spade, or hoe, for the reception of seeds or plants, is a process so universally practiced and indispensable for the well-being of the crops intended to be raised thereon, that it may be deemed incredible that such a common and simple affair should not be universally understood. And yet it cannot be denied that many and frequent mistakes are committed in this matter, and these must proceed either from indolence or ignorance.

As the surface of the earth is the natural station for the generality of plants, and where they obtain the necessary elemental food requisite for their development and maturation, certain conditions of the said surface are absolutely necessary. Humidity, heat, and air, in due proportions, are indispensable, both to the fibrous roots which are extended in the earth and to the head which is expanded in the air. There is more danger, however, from an excess of moisture than from the extremes of either heat or air; because, when the soil is saturated with water, the access of the genial air and its gaseous properties is excluded, and the delicate fibres, imprisoned and choked, it may be said for want of breath, must, in such a case, necessarily languish. That a porous soil is requisite for the free growth of every plant is an axiom in cultivation, and on this axiom all our operations of plowing, trenching, digging, &c., are founded; and, that no excess of water should at any time remain to chill, sodden, and consolidate the staple, draining in all its branches and modifications is had recourse to.

Soils are various in quality, and particularly in texture and consistency. The success of crops appears to depend as much on the texture of the land as upon any other property. For, where air and rain can permeate freely, a constant supply of both aqueous and gaseous nourishment is afforded, independently altogether of the richness of the soil, whether natural or artificial. While, on the other hand, if the soil be compact, baked hard by drouth, in consequence of its having been previously labored or stirred when too wet, no plant can possibly flourish. The conclusion, therefore, is, that the soil for any kind of crop should never be impervious to air from being saturated with water, nor impervious to both air and water from its dry adhesiveness.

Sandy soils, upon a gravelly or chalky subsoil, are never liable to be drenched with water but only for a very short time after heavy rain, or sudden thaw when snow is on the ground. All the water absorbed by such a soil sinks deep into the subsoil, and far below the roots of corn or any agricultural plant on the surface. Such a soil needs neither draining nor subsoil plowing. Neither does it ever require to be exposed to the frosts of winter, or any kind of treatment by implements to produce ameliora-

tion. It is almost always in such an open friable state that it may be plowed and sown at any season, without risk of being plowed and harrowed into the condition of mud, or of being poached into the state of mortar by the horses' feet.

In some countries there are large tracts of such land, and on these farmers are generally fortunate men. The culture is easy, and executed at a moderate expense. The crops of turnips are heavy; and if, besides the ordinary supplies of dung and tail-dress, the farmers can manage to give their fields a liberal coat of marl or reducible clay every eighth or tenth year, the heart and fertility of the staple is maintained unimpaired for ages.

In such descriptions of land, however, it often happens that beds of clay lie alternately with those of sand at different depths beneath the surface. These beds of clay, if the general surface of the farm or field lies sloping, crop out at different distances below each other and above each the surface staple will be either occasionally or constantly wet. If a pasture, rushes will appear accompanied by the worst grasses, and herbage produced that will certainly rot sheep, especially if introduced from drier pasturage. If the land be arable, the crops raised thereon will be unequal; on the wet places, the corn will be either too rank and inferior, or fail altogether. In such cases, efficient under-ground drainage is the remedy to get rid of the superfluous moisture, either by gently-falling diagonal or direct channels. The proper direction of the drains depends on the depth, extent, and inclination of the beds of clay, and it is well to have a professional man to stake them out, unless the tenant has a sufficient knowledge of geology himself. It is surprising to those who know but little of the nature of the various strata of the earth's surface, how easy it is in some cases to get rid of surface water. For instance, if there be wet and dry places on the same field, the owner may be assured that a bed of clay, or other kind of earth impervious to water, lies beneath the wet, and a porous subsoil beneath the dry places. A drain of sufficient depth opened (and filled nearly to the surface with stones or loose gravel) from the wet to the dry places, will certainly render the whole dry. In my own practice, and acting on this principle, I have been in many cases very successful in laying arable fields dry. Two cases I may mention as examples:—A field of eleven acres, of a fine loam, suitable for wheat, beans, or indeed any other crop, had a hollow near one of the ends, which was every winter filled with water, and ruinous to wheat or grass, very frequently to the extent of between two and three acres. This I resolved to drain. A neighboring farmer predicted that the attempt would be a failure; because his father, when tenant, sunk a shaft to the depth of above seventy feet, in the lowest dip of the hollow, and filled it with stones, expecting that this would form a *swallow* for all the rain and melted snow retained by the hollow. But this expectation was not realized; the water first filled the pit, and then flowed over the land as before. The cause was easily comprehended: the pit did not reach to the chalk-rock, nor did it pierce through any porous stratum; its loamy sides and bottom were perfectly water-tight, so that little or none could escape.

My plan was different. I saw marks in an adjacent field of where chalk had been drawn at some former time; thither I opened a stone-filled drain below the plowshare, from the lowest dip of the hollow; and, when the water had accumulated, it ran towards the old chalk-pit; but totally disappeared long before arriving at the place, and thus was a valuable field laid dry. Another arable field contained a pond, which very often overflowed its boundaries. Lower ground was at the distance of half-a-mile; and the expense of forming so long a drain prevented all attempts to get rid of the annoyance. I advised the tenant to dig a deep drain from the pond up into a high bank of gravel, into which the water oozed away immediately; and ever after carried off all excess. By this simple expedient a large piece of excellent land was reclaimed and brought into a regular course of culture at a very trifling expense.

It is by such means that land, naturally friable and loose in texture, may be relieved of superabundant water, and give admittance to the necessary supplies of air at all times. I have already observed that sandy soils require no exposure for the purpose of reducing adhesiveness either by the action of frost or machinery; and yet we often see such land carefully fallowed up in the autumn, and even laid in ridges, to receive the advantages supposed to be imparted to it by the contact of frosty air. That such an idea, namely, that arable land is benefited by exposure to frosty air, has been long entertained, is evident from what has been written on the subject by old authors. Even our amiable poet, Thomson, in one of the flights of his pregnant imagination, says—

> "The frost-concocted glebe
> Draws in abundant vegetable soul,
> And gathers vigor for the coming year."—*Winter.*

Showing that the notion was held by philosophers as well as cultivators; and, at the present time, there are many among the latter who mistake the disrupting, ameliorating effects of frost on tenacious soils for its enriching property, which they imagine is communicated to all soils. But this is a mistake; the less light sandy soils are exposed to the sun and air, the less are they exhausted of their humid riches. Their best qualities are as liable to be washed away by winter rains as dissipated by the summer sun; and, therefore, they cannot be too close and level during winter if it is intended that they should be cropped in the spring.

I have often noticed the mismanagement of a field of light soil by the following culture:—It was fallowed, cleaned, dunged, plowed, and sown with tankard turnips about the middle of June. The crop was abundant, and a flock of full-mouthed wethers was put on in the end of September. Within a month, the turnips were eaten off, and the field was plowed into single 'bout ridges to lie for the winter. In April, the ridges were plowed and harrowed down, and barley and seeds were sown. Both rose well; but, throughout the summer growth, the ridges were as visible in the crop as they were after the plow, the centres of the ridges bearing the finest and strongest plants of the crop. And the reason was obvious: the centres of the ridges came up fresh, moist, and mellow, while the intervals were filled with the bleached dry crests of the ridges, which, though more pulverized, were much less fertile and stimulating than the fresher portions of the surface. Hence it was quite evident that, if the whole field had been permitted to lie undisturbed till the spring, the crop would have risen more equally and

much more vigorously. I have seen fields of similar soil sown with oats after wheat—a bad custom certainly, and as badly executed—the wheat-stubble being plowed in October, and the oats sown and harrowed in February, whereas, had the wheat-stubble been only scuffled off and harrowed to bring up a crop of seed weeds, and so rested till February or March, and then plowed and sown, the crop of oats would have been much more abundant both in straw and corn than by the former method.

Here it is necessary to observe that, as I set out with showing how absolutely necessary an open porous soil is to all vegetation, and no measures being recommended in the above statements for that purpose, but rather the contrary, it is to be remembered that I have been treating of sandy land, which is at all times, except when too wet, sufficiently porous for the reception of air. But in other descriptions of soil, such as that whose particles are minute and have a tendency to adhere closely together, either by gravitating subsidence or by a flow of rain water—in such a case, every practicable means must be taken to alter and break this solidifying nature of the staple, in order to admit a free range of air and the gases it contains.

There are many intermediate descriptions of soil between sand and clay, and all of these, according as they approach to the one extreme or the other, require a peculiar management, But the grand object is to work the soil in such a manner that it shall always be pervious to air, rain, and all atmospheric influences. And this result is obtained by the *timely* application of the implements rather than by the efficiency of the implements themselves. The soil is sometimes in a fit state to be worked, and very often is not. Under such circumstances the judgment of the cultivator must be exercised. The condition of the land depends very much on the season and character of the weather; and on this account seed-time cannot always be commenced at the times which would be most convenient to the farmer. In such a case, he must wait until the land is in right order to be stirred; and that state is, when it is neither too wet nor too dry. I am alluding to land which has either been thoroughly drained or which needs no draining, and is only affected by the season, whether very wet or very dry. But as the exact time cannot always be hit upon, it is better that the arable surface be rather too dry than too wet when moved. Because, if too dry, it may be reduced to the necessary fineness by labor, and will then be in the best possible state for the reception of seeds; the interstices between the particles of the soil being filled with air, amid which the imbedded seeds germinate in the greatest vigor. But if the soil be too wet when moved, and especially by the pressing or pushing action of the plow, it acquires, from the excess of water, a state of fluidity like mortar, and settles down again so compactly, that no seed laid therein can be developed in a healthy condition, in consequence of the want of air.

That the contact of air to the roots of plants was always considered necessary, is evident from old writings; but the fact has never been so generally noticed and acted upon as it is now. 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 levelling lawns; and planters and gardeners have been long aware of the injurious effects of planting as well as sowing too deep. The same individuals formerly fancied that their prepared composts, for exotic or favorite flowering plants, could not be too finely sifted for their reception, whether in pots, or in the open ground. But slovenly or careless management in these particulars showed that too much nicety of execution was not at all necessary. Sifting the composts was given up, and composts made up chiefly of nodules of turf, broken stone, brick rubbish, &c. are substituted with evident success; and the cause is obvious—when the compost is sifted, it becomes a solid mass, especially after it is watered, and repulsive of all atmospheric influences, whereas among the loose materials, a considerable body of air reposes, and in this the more active fibres extend themselves much more luxuriantly than they do in compact soil.

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; viz. alluvial soils and fertile clays. Both these descriptions of soil being composed of the finest atoms, become exceedingly close and compact if undisturbed; but when plowed, or otherwise moved periodically, 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 subsoil, it does not seem to affect rich alluvial land; and this I imagine to be entirely owing 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 earth, but 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 driest 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; [or parasitical plants, as the Misletoe;] 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 most 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 we see that air is particularly necessary to plants, and as much so to the roots as to the head and foliage; and it is this fact, as already observed, that justifies all the means of cultivation which we have recourse to with a view of rendering the staple more loose, and consequently more permeable to all 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 closely embedded in the soil, that is, they should be in close contact with the mould all round; and, that this should be completely secured, some seeds require to be laid in *heavy*, 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, it is the practice to tread 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 aeration 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, every thing 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 the plants.

ON THE VALUE AND PROGRESS OF AGRICULTURAL SCIENCE.

THE dignity of Agriculture was rightly vindicated by the younger WADSWORTH, when declaring that "there is no pursuit in which so 'many of the laws of nature must be consulted and 'understood, as in the cultivation of the earth." The New-York State Agricultural Society, honored itself when honoring him with its Presidency; and we know not how we can better promote its noble objects more effectually than by disseminating the sentiments which have influenced that gentleman in devoting his energies and the influence of his example to the agronomic interests of his countrymen. The importance of *associated effort*, as well as the value of intellectual investigation and scientific research, were properly enforced in his Addresses on the subject of Agricultural Improvement; and we freely occupy the requisite space with extracts from one of those productions, with the fervent wish that the interest which has been manifested by Mr. Wadsworth of Genesee, Mr. Lenox of this city, and Mr. Colt of Paterson, and other men of fortune, who might be named, may be more extensively emulated—men whose wealth and influence enable them to exemplify and sustain the claims of Agriculture upon the attention of the rich even more than the poor, upon the millionaire and the scholar even more than upon the Farmer of more limited means.

The paramount want of the landed interest in this country, is *capital*. Thousands have too much land, who are restricted in every means necessary for its improvement. Of what value will be all the science and all the improved labor-saving implements and improved domestic animals, if the means cannot be found for their introduction and practical application.

What Farmer of moderate circumstances, for example, can send to Peru for the Apachian Sheep, which every consideration founded on a knowledge of its qualities leads us to believe ought to be imported and tested in our country? Is it not then obviously, in direct proportion to their fortune, that opulent men, inspired with a noble ambition, can entitle themselves to the benedictions of their country. If there be any truth in signs, even the political horoscope is full of them to show that the day is at hand when men are to find present popularity, as well as true glory, in promoting the *arts of peace*—in equalizing the comforts and augmenting the happiness of their fellow men. For us and our House, we shall ever stand ready to exalt the names of men who with the means, unite the taste and the noble feeling to put their hands to and say, *God speed the plow*. But our own feelings would carry us away—let us back to our theme.

For all classes of society there is certainly instruction and consolation in the following passages on the application of Science to Agriculture: "The application of science," said Mr. WADSWORTH, "the most profound which has 'yet been attained by the far reaching efforts of 'the human mind, to all the products of our in'dustry—to the soil, the crop, the animal—has 'been reserved for the age in which we live. It 'is not claiming too much to say, that more pro'gress has been made in this direction within the 'last twenty years than in any previous century. 'Our own countrymen, it is gratifying to per'ceive, are securing their share of this abundant 'harvest. Our chemists and geologists will not, 'we may be sure, rest contented as industrious 'gleaners after the Davys, Liebigs and Johns'tons of other countries, but will push forward 'into the ample domains, which even those 'acute discoverers have not penetrated.

"From the origin of our race *almost* to the present time, the path of the husbandman has been clouded in darkness and doubt. From the sowing of the seed to the gathering of the harvest, mystery attended every step. The first link in the great chain of cause and effect was hidden in uncertainty. The precepts of tradition, the result of a multitude of experiments, were founded mostly in wisdom; but they were as inexplicable as they were sound. Not so now. The scientific analysis of soils, of manures, and of vegetable products, explains not only the workings of nature and the practices of art, but opens an inexhaustible field of new combinations and novel results. * * * *

"If other nations, in the vigor of maturity, with more leisure and more means than we possess, have outstripped us in the race of philosophical discovery, let it be *our* boast, that we have spread these discoveries *wider*, and made them at once available by making them part of the current knowledge of the nation. Let it be our first aim to diffuse knowledge—where the constitution has rightly given power—to the whole people.

"It is not the sole object of our Society to reward those who bring to our Fairs the finest animals, or to remunerate those who, with skill and industry, raise the best crops. These are but the means, and part of the means, by which it is hoped to achieve higher and wider ends. We wish, *by association*, by comparison of ideas, and by a generous emulation, to diffuse among ourselves, and the mass of the agricultural community, the results of experience, the lights of science. and the productions of art.

"Of the incalculable power, for good and evil, of *association and combined effort*, the present age abounds in illustrations. That this great element of man's power has often been wielded to trample upon the equal rights, the peace and happiness of society, cannot be denied. Of the many instances in which, with widely different and higher aims, it has effected the noblest achievements, I shall only refer to one. With what language can we describe, with what powers of calculation estimate, the wide-spread good accomplished, the deep misery warded off, by temperance associations?—What individual, wielding even a despot's sceptre—what government, monarchical or democratic—what law—what armed force, could have achieved the great results brought about in our day, within our own observation, by these efforts? With this signal illustration before us, we cannot lack confidence in any efforts wisely directed to a good end. With motives which cannot be impeached, with objects which can no where be condemned, asking no special privileges, requiring no exclusive immunities, seeking only to elevate and render more effective that labor from which man is destined never to be exempt, we may surely here, if any where, call to our aid the great power of association and combination.—With this element of strength we wish to awaken the public mind to a sense of the importance of our avocation, and to dispel whatever may be left of that ancient prejudice, that the tiller of the soil is the drudge of the human race.

"*It is strange that it should have been overlooked*, even in the darkest days of despotism and ignorance and superstition, that he who sows the seed and reaps the harvest, works not only with the plow and with the hoe and with the scythe, but that *he wields*, far beyond the laborer in any other branch of industry or art, *the elements of powers and nature*. There is certainly *no pursuit in which so many of the laws of nature must be consulted and understood, as in the cultivation of the earth*. Every change of the season, every change even of the winds, every fall of rain, must affect some of the manifold operations of the farmer. In the improvement of our various domestic animals, some of the most abstruse principles of physiology must be consulted.

"*Is it to be supposed that men thus called upon* to study, or to observe the laws of nature, and labor in conjunction with its powers, *require less of the light of the highest science, than the merchant or manufacturer?* Or is it to be believed, that men who go weekly, almost daily, to different occupations, changing with the almost unceasing changes of the seasons, and whose business is to bring to maturity such a multiplicity of products, exercise less the highest intellectual faculties of man, than the laborer who, day after day, and year after, follows the unchanging manipulations of art?

"Happily for the interests of the farmer, the history of our country abounds in evidence that this great misconception of the nature and tendency of agricultural labor no longer exists."

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"It is not alone in the brilliant results of scientific investigation, nor in the fertility of the soil, nor in the general salubrity of the climate, that the American farmer finds the ground of his brightest anticipations for the future. There are other and higher elements in the composition of his fate. The government which watches over him is the government of his choice—a government in which the permanent interests of the great mass of the people are secured by placing the power in their own hands. Under such institutions the pendulum of public justice may sometimes vibrate between dangerous extremes, but it must eventually repose where justice and the interests of the many, require that it should rest. Such are the hopes of the farmers of our country. It is not to be denied that their interests have been sometimes neglected, and their rights sacrificed to the sinister aspirations of classes more favorably situated for political combinations; but if there is any foundation for our faith, that a free government is the fountain of equal justice, these aberrations must be corrected in the slow but certain progress of truth and right.

"I trust that American agriculture will illustrate and confirm the striking remark of the author of the 'Esprit des Lois,' a writer, the most philosophical and liberal of his time, 'that it is not those countries which possess the greatest fertility, which are the best cultivated, but those which have secured the most liberty.' I find this suggestion, so flattering to our hopes, eloquently commented upon by a late distinguished agriculturist of our country, in an address which he delivered before the Agricultural Society of Pennsylvania; and I gladly avail myself of this opportunity to pay to his memory a tribute of respect, which is due, in a more eminent degree, to but one other name in the history of American farmers and patriots. With many other improvements in agriculture, Judge Peters was emphatically the author of the plaster and clover culture. The time which your patience will allow me to occupy on this occasion, will not permit me to recount the many experiments, at once ingenious and philosophical, with which he demonstrated the wonderful efficacy of plaster, nor the efforts, equally persevering and philanthropic, with which he labored to introduce into general practice, this great fertilizer. He succeeded. None but those well acquainted with the course of husbandry in our wheat-growing districts, can estimate how much of the eighty-four millions annually produced in our country, is owing to the introduction of plaster and clover. The benefits of this improvement are to be counted by annual millions; and I call it up to your attention, not only to pay the debt of gratitude due to its distinguished author, but as an incentive to those who, with the better instruments of a more advanced science, have the

same field of practical improvement before them. It is happily the nature of human knowledge that *the more it achieves*, the *larger is the field of achievement*. As the outer circle of invention and discovery is pushed farther and farther from the centre, the more numerous and of a higher order are the objects which present themselves to the investigation of those whose lofty ambition it is to add something to the mass of human attainment.

"The Society has endeavored to contribute something to this onward movement by offering prizes for essays upon the application of science to agriculture. I trust that the result will vindicate the wisdom of this policy, and lead to its continuance.

"In this country, with just laws, justly administered, where the popular voice can promptly correct every oppressive enactment; where, with common schools and an untrammeled press, knowledge circulates as freely almost, as the air we breathe, it would be surprising, and not less discreditable than surprising, if agricultural improvement did not keep pace with the progress of the country in every other respect. For one, I have no fears on this point. I believe that our progress, with or without Agricultural Societies—though greatly accelerated by them—is to be decided and rapid. I am not, however, unaware, nor should we ever lose sight of the fact, that agriculture, like learning, has had its dark ages. It has risen to great perfection, receded, and rested for centuries without any apparent improvement. The history of the world abounds with evidence that the cultivation of the earth was at an early day carried to a high point.

"In China, it is well known that for uncounted centuries a degree of skill has been exhibited in the preparation and application of chemical and vegetable manures, that is not, even now, equaled in any part of Christendom. A recent popular writer counts it as not the least valuable result which may flow from the Opium War, as it is properly designated, and which it is to be hoped for the honor of humanity, is now terminated, that by opening a more general communication with that extraordinary people, we may learn something of their agricultural skill. The Chinese are not the only people beyond the pale of Christianity and modern civilization, who have attained a remarkable degree of skill in certain branches of husbandry. The aborigines of South America and Mexico practised irrigation upon a scale, and with a perfection of detail, not surpassed in any modern improvements.—The Spaniards, superior to them in the art of war, overcame them in battle, but have not equaled them in skilful and industrious tillage.

"Throughout all those immense regions of British India, where the indomitable perseverance and courage of the Anglo-Saxons have subjected millions to the control of thousands, the conqueror has learned more than he has been able to impart of practical wisdom directed to the cultivation of the soil. A high cultivation, accompanied by the use of irrigation and mineral and vegetable applications, has there carried the productive powers of the earth to a point never yet attained in those parts of the globe claiming to be more enlightened.

"In ancient Egypt the results were, if possible, more extraordinary. There, not only agricultural productions, but the imperishable monuments of art, surpass even the comprehension of modern science.

"Coming down to the early days of Christian era, we find the Roman writers abounding in sound precepts and suggestions, which even now might be adopted with advantage. Nearly the whole of Varro might be read with profit by our modern farmers. True, it is often tinged with a superstition now happily discarded, and relates to a state of society and government, widely differing from our free institutions.

"But in all that relates to tillage, to the preparation and application of manures, his suggestions accord with the views of our best modern practical farmers. In the classification of mineral and vegetable manures, such as lime, marl, and many varieties of compost, he gives to each the relative value which has been affixed by the most profound chemical analysis.

"If it is somewhat discouraging to look back and find ourselves but little in advance of the remotest times, in many departments of our profession, we may at least, congratulate ourselves that we live in an age when agriculture is in the ascendant. It is no longer given up to serfs and slaves, as the fitting occupation of the most ignorant portions of the community. It now takes its rank among the honorable and elevating pursuits of industry. To follow the plow and tend the flock, is no longer, here at least, the mark of ignorance and servitude, as under a false and despotic system it was, and in some parts of the globe still is. In this we stand upon ground which the ancients never attained. It is the great achievement of modern times. The rights of man and the dignity of labor are vindicated—the one follows from the other. Agricultural improvement, then, rests upon a foundation on which it never stood before. It is sustained by free institutions; it is the result of laws, wise, because liberal. The enfranchisement of the many, the elevation of the masses, must go hand in hand with the intelligent, industrious, and prosperous cultivation of the earth.

"If agriculture owes much to the benign influence of free institutions, liberty owes not less to agriculture. Where do we look for the calm discretion, the disinterested patriotism, which must sustain a representative government, but to the great community of cultivators of the earth? Even those most skeptical as to the fitness of man for self-government, admit that if the experiment ever succeeds, it will be in a nation of farmers. The experiment, thank Heaven, has succeeded; it has succeeded in a nation of farmers; and while we must not be guilty of the illiberality of doubting that the great manufacturing nations of other continents may be fitted to administer the high duties of freemen, it becomes us to cherish a profession which, more than any other, prepares man to receive the highest blessing of his race in this world—a free government. We must cherish it by industry, by virtue, by intellectual cultivation; by connecting it with science and the arts, and with every thing which can elevate and adorn it. If we do our duty by ourselves and our children, agriculture will never again, it is to be hoped, know the dark ages in which for so many centuries it slept with liberty and learning. Let us do our duty in the responsible station and happy era in which Providence has cast our destiny, and I trust the day is far, far distant, when we shall cease to be a nation of farmers and a nation of freemen."

A SCENE—*In a Tent of Agricultural Editors.*

A GREAT Exhibition of the products of American Agricultural, Manufacturing and Mechanical industry, being held, as is supposed, at Washington, D. C., under the auspices of the NATIONAL INSTITUTE, on which Congress, after long protracted and shameful delay, had bestowed the Smithsonian Fund—the Editors of the Agricultural papers have assembled in the tent appropriated for their use, exchanging friendly greetings, when he of the "FARMERS' LIBRARY," and founder of the old American Farmer, enters, and, being to many of them unknown, thus makes his respectful salutations:

Friends and Brothers: When a man enters a room unbidden, and, it may be unknown to most of the company, claiming fellowship, and a seat among them, common courtesy should prompt him to say, with a certain character in the farce, "*Hope I don't intrude?*" He who now addresses you, however, has the advantage of knowing at least as many of the present company as may suffice to introduce him to the rest.

When he retired from the corps Editorial, some years since, he could have identified nearly all who belonged to it. The kindest sort of personal intercourse, or a no less kind interchange of good will by friendly correspondence, had passed—the remembrance of which, he flatters himself, may make the renewal of that intercourse now, mutually and without exception, agreeable. But, on looking around the room, he cannot but ask himself how it is that, while he left the plow only for a short spell, and even during that time running a furrow, occasionally, for some old fellow-laborer, that, coming back now to regular work, he finds so many *new* faces in the same field? most of them, he thinks, looking smarter and more alert—doing their work in a *leetle* better style than when he first broke new ground in the old *American Farmer.* Dare he flatter himself that these weekly streams and monthly floods, that are pouring their salubrious waters far and wide to irrigate and fructify the land, are but so many issues from the old fountain, opened by him on the 2d of April, 1819? Are your journals but the produce of that old parent stem, which have sprung up, as the seeds of plants of the class syngenesia, furnished with a plume, are, by that admirable mechanism, disseminated far from their parent stem? or, are they, rather, vigorous shoots, of spontaneous growth—such as genial skies and showers always bring up in the wake of cultivation, to succeed the coarser herbage of Nature? At all events, their appearance is a proof that the wants of Agriculture demanded them. Friends! I rejoice to find myself once more in such honest company. To each and all I would fain extend the hand of fellowship; and why not a hearty greeting for the whole corps Editorial—

"To you, Tom Brown! and to you, John Brown!"

as the social song runs? Have not all an equal interest in the prosperity and good name of our common country? Are we not all seeking to awaken and to gratify a love of knowledge, and with it *charity and union?* Here are advocates from all quarters to guard every Agricultural interest and staple, as it is right there should be.

> "Nor yet will every soil, with equal stores
> Repay the tiller's labor; or attend
> His will, obsequious, whether to produce
> The olive or the laurel."

There stands friend BRECK, from "down East," the noble old Bay State, to tell us, in the New-England Farmer, all about the disease in potatoes; and there, again, are brothers North and Phillips, of the "South-Western Farmer," leaning on their cotton plant, and talking learnedly of *gossipium;* while Botts, full of zeal and intelligence, stands midway, ready with his tobacco-stalk to demolish all the *humbugs* that may come flying along in quick succession, like so many *ignes fatui,* to delude the honest "Southern planter." Ah! and there, too, is the vigorous driver of my old team—the *Editor of the American Farmer!* Well, I am too glad to see him still upon his legs, and, though he is dressed off in a *new suit, he* won't give the "*cold shoulder*" to an old fellow-laborer. He can vouch that in the many years that we wrought in the vineyard which we planted, and that he has since brought into more perfect bearing, not a line, nor a word, ever escaped us, in expression of party feeling or the provocation of ill-blood. Let us all, then, I say—old soldiers and young recruits—unite to keep off the rust with which Time, like the worm, that gnaws at the root, night and day, would weaken the chain of friendship. The world is wide enough for all, even though we were not stretching our arms to grab at once the Cape of Labrador and the Halls of the Montezumas. And, moreover, let us remember what we are taught on the highest authority—"Brethren! the time is short." Let me, then, close this address to brther Editors, of whatever interest or party, by asking *one favor.* If you would welcome him to put his feeble sickle in the common field, will you please copy this, or otherwise proclaim that

SKINNER—we won't say in his *old* age—(let that word become "obsolete")—has rejoined the Editorial phalanx, and set down now, with no other employment, to make his bread by assisting to teach others, in "THE FARMERS' LIBRARY," how to make theirs.

The Farmers' Library and Monthly Journal of American Agriculture will have no sort of connection, near or remote—direct or contingent, with any political object or paper. In Agriculture there is no party politics. The publication will consist of at least 100 pages a month, to be made up of standard works on practical Agriculture, and all sorts of treatises which it may be becoming and useful for a cultivated Farmer and his family to read, either for solid instruction or elegant amusement in any way connected with his condition and pursuits in life.

The engravings, lithographs, paper, type, &c. all to be of first quality—making two volumes per annum, of at least 1,200 pages, all for $5 a year. Address J. S. SKINNER,

Editor of the Farmers' Library,
Tribune Buildings, New-York.

THE POETRY OF RURAL LIFE.

IT is to be hoped that few or none of the readers of the "Farmers' Library" entertain the notion that an Agricultural publication should be utterly barred against the Muses—exclusively confined to the mere dry statistics of Farming industry. Horses, corn and oxen—pigs, poultry and potatoes—are all valuable in their way; and we will go as far as any one to encourage improvement, so as to realize the greatest proportionate value from the investment of labor and capital. But we are far from thinking that poetical associations are incompatible with rural pursuits; and, indeed, we fancy that much service may be rendered by irradiating country life with the charms of Song. The spirit that led to the introduction of Music in our Common Schools animates us in the belief that similar benefits may result from the better culture of the imagination, (as well as the soil) among the Farming community. Indeed, we fancy that we cannot better promote a preference for rural pursuits, and thus aid in benefitting the Agricultural interest, than by appealing to the taste, as well as the intellect, through occasional quotations from the writings of poets who "looked through Nature up to Nature's God."

Who that is familiar with the poetry of BRYANT can ever enjoy the solemn grandeur of our forests without realizing some of the ennobling sentiments which breathe through such poems as that commencing with these lines;

"The Groves were God's first temples. Ere Man learned
To hew the shaft, and lay the architrave.
And spread the roof above them—ere he framed
The lofty vault to gather and roll back
The sound of anthems; in the darkling wood,
Amid the cool and silence, he knelt down,
And offered to the Mightiest solemn thanks
And supplication."

Our purpose is not to sermonize at the present time, but rather to invoke the attention of our city friends towards the attractions presented for recreation in the country during this "merrie month of June." And how can we enforce our object more agreeably than by quoting, from the Dublin University Magazine, some stanzas written by the late Mrs. Gray?

"Go forth into the country,
From a world of care and guile;
Go forth to the untainted air,
And the sunshine's open smile.
It shall clear thy clouded brow—
It shall loose the wordly coil
That binds thy heart too closely up,
Thou man of care and toil!

"Go forth into the country,
Where gladsome sights and sounds
Make the heart's pulses thrill and leap
With fresher, quicker bounds.
They shall wake fresh life within
The mind's enchanted bower;
Go, student of the midnight lamp,
And try their magic power!

"Go forth into the country,
With its songs of happy birds,
Its fertile vales, its grassy hills,
Alive with flocks and herds.
Against the powers of sadness
Is its magic all arrayed—
Go forth, and dream no idle dreams,
Oh, visionary maid!

"Go forth into the country,
Where the nut's rich clusters grow,
Where the strawberry nestles 'mid the furze,
And the hollyberries glow.
Each season hath its treasures,
Like thee, all free and wild—
Who would keep thee from the country,
Thou happy, artless child?

"Go forth into the country!
It hath many a solemn grove,
And many an altar on its hills,
Sacred to peace and love.
And whilst with grateful fervor
Thine eyes its glories scan,
Worship the God who made it all,
Oh! holy Christian man!"

CLAIMS OF AGRICULTURE UPON THE BUSINESS COMMUNITY.

To Merchants, Manufacturers and others on the Calamities of Trade:

THE vicissitudes attendant on trade have essentially aided in enforcing the claims and advantages of Agriculture upon the attention of the business community generally—upon the Manufacturer, Mechanic, Merchant and "professional man," as well as upon the "natural born" Farmer himself.

Singular as it may seem to the unreflecting, the statistics of our cities and towns will prove that the operations of the trading world are subjected to more than lottery-like uncertainty, for whereas, in lotteries there may be not "two blanks to a prize," there is a still larger proportion of disaster resulting to persons whose fortunes are embarked in trade.

The history of the trading community, in almost any given district, conclusively proves the startling fact that full three-quarters (aye, even a larger portion) of merchants and manufacturers are driven from their stores with shattered fortunes and mind depressed; aggravated by the reflection that in prosperity they had neglected to make suitable provision of agricultural property and knowledge, which would have proved a comfortable homestead, at least, for their declining years—thus guarding their families from being thrown upon the cold charity of the world, or from having recourse for a wretched and precarious livelihood to some revolting employment.

Though Farming holds out no decoying hopes of large fortunes to be *speedily* realised, it furnishes, if pursued with economy and industry, in the first place a certain shelter, with unfailing means of comfort and independence to those who apply their intellect as well as diligence in cultivating the soil; and in what branch of industry can intellect be more advantageously employed for promoting individual happiness and national welfare?

Far be it from our thoughts, in any wise to undervalue the importance of mercantile and manufacturing pursuits; too highly do we esteem them, as promoters of civilization and indispensable purchasers and consumers of the surplus fruits of Agricultural industry itself. The Merchant and the Manufacturer, when just and liberal, as well as intelligent and enterprising, may be classed among the noblest of our race; for doubly honored should they be, who, daily beset with the multitudinous allurements of the world, and exposed to its most unexpected and trying vicissitudes, yet, in spite of all these, pursue the course of honor triumphantly through life. But surely a reasonable degree of attention to Agriculture and Horticulture—attention in storing the mind with valuable information on the theory and practice of arts which lie at the bottom of all earthly pursuits. Surely, surely such attention cannot injuriously interfere with assiduous devotion to commercial and other industrial pursuits, but, on the contrary, afford, by diversity, that occasional recreation which gives power to prosecute them more vigorously.

The history of the whole trading community speaks volumes of admonition on the importance of making for your families, in days of prosperous adventure, some *certain, substantial terra-firma* provision, however small, for your families. Even amid the turmoil with which we are surrounded in these large cities, the following startling assertions, made recently in public discourse by a distinguished citizen of New-England, will scarcely fail to force their way to the anxious attention of every prudent business man. We respectfully wish it to be borne in mind, that it will be one of the leading objects of the FARMERS' LIBRARY, to aid in attracting the attention of such men toward the pleasures and advantages of rural pursuits, and to inculcate on all such the propriety of securing (while fortune enables them honestly to secure,) a comfortable little farm, however small, for "the family," where the trader, unfortunate in business, as a large portion of them sooner or later become, may spend the evening of his life, with the comforting reflection that, while he could justly do it, he had the prudence and intelligence to provide a homestead, beyond the reach of fraud or accident at home, or the disasters of the sea. For such men, as well as for those whose only business now is Agriculture, we design the "FARMERS' LIBRARY," and flatter ourselves that we may look to the trading community, to the prosperous Manufacturer and the fortunate Mechanic, for such a share of patronage as will indicate that the comforts and amusements of Agriculture and Horticulture are duly appreciated in the intervals of business; and that they agree with us in the opinion, that nothing can be more expedient than to provide a *snug farm* as a retreat for wives and children, when driven

from the city by enfeebled health, declining business, or, otherwise, total bankruptcy—until circumstances lead him to occupy it himself, it may afford an honorable field of industry and intellectual employment for a son, who might otherwise be wasting his life and energies in town; or may be rented at a saving interest to a good tenant. To either of these, the FARMERS' LIBRARY, *and Monthly Journal of Agriculture*, might be turned over, to excite in the one a fondness for agricultural science and literature, and so practically instruct the tenant as to secure certain improvement of his property and easy payment of his rent.

Let those who have not carefully reflected on these matters, now maturely consider the statements, made by Gen. DEARBORN, in a Lecture delivered before the Massachusetts Agricultural Society. While contrasting Agricultural and Mercantile pursuits he remarked that men should instil into their sons a *love of Agriculture*. He declared that he would prefer a cottage in the country, with five acres of ground, to the most splendid palace that could be erected in the city, if he must depend upon the success of merchandize to support it. He then went on to say, "that having been some fifteen years in the Custom-house, in Boston, he was surprised to find, at the close of his term, an entire new set of men doing business there. This induced him to look into the subject, and he ascertained, after much time and research, that ninety-seven out of every hundred who obtained their livelihood by buying and selling, *failed* or died insolvent. He then submitted his calculation to an old merchant of great experience, who confirmed it in every particular.

"The statement made by General Dearborn, appeared to me so startling, so appalling," says an intelligent observer, "that I was induced to examine it with much care, and I regret to say I found it true. I then called upon a friend of mine, a great antiquarian, a gentleman always referred to in all matters relating to the city of Boston, and he told me that in the year 1800, he took a memorandum of every person on Long Wharf, and that in 1840 (which is as long as a merchant continues business) only five in one hundred remained. They had all in that time either *failed* or *died* destitute of property. I then went to a very intelligent director of the Union Bank (a very strong bank); he told me that the bank commenced business in 1798, that there was then but one other bank in Boston, the Massachusetts Bank, and that the bank was so overrun with business, that the clerks and officers were obliged to work until twelve o'clock at night, and all Sundays; that they had occasion to look back a year or two ago, and they found that of the one thousand accounts which were open with them in starting, only six remained; they had in the forty years either all *failed* or *died destitute of property*. Houses whose paper passed without a question had all gone down in that time. Bankruptcy, said he, is like death, and almost as certain; they fall single and alone, and are thus forgotten, but there is no escape from it, and he is a fortunate man who *fails young*. Another friend told me that he had occasion to look through the Probate Office a few years since, and he was surprised to find that over ninety per cent. of all the estates settled there, were insolvent. And within a few days, I have gone back to the incorporation of our banks in Boston. I have a list of the directors since they started. This is, however, a very unfair way of testing the rule, for bank directors are the most substantial men in the community. In the old bank, over *one-third* had failed in forty years, and in the new bank a much larger proportion. I am sorry to present to you so gloomy a picture, and I trust you will instil into your sons, as Gen. Dearborn recommends, a love of agriculture, for, in mercantile pursuits, they will fail to a dead certainty."

Are the business men of New-York, Philadelphia, Baltimore, Washington, Richmond, Charleston, Savannah, New-Orleans, Louisville Cincinnati, St. Louis, more prudent, sagacious, or successful than those of Boston? And whether they are or not, the foregoing extraordinary facts indicate the propriety with which we invoke the business community, to bestow more attention upon *Agriculture*, for recreation in the season of a prosperity, and for sure refuge in adversity.

The Farmers' Library and Monthly Journal of Agriculture—(consisting each number of not less than 100 pages)—of which the first number is herewith presented to the public, was established partly with a view to supplying Merchants and Manufacturers, as well as Farmers, with every species of information connected with the culture and management of Farms and Gardens—and under a proper sense of the liberality with which well-meant enterprises of this sort are sustained by all enlightened communities, we confidently anticipate a reasonable share of that patronage, which will enable us to extend our usefulness in the broad field upon which we have entered.

GIGANTIC GERMAN GREEN.—There was growing, in 1842, in the garden of Mr. John Murray, Easter Newport, Fife, a plant of German greens of extraordinary dimensions. It was planted about four years ago, in the ordinary way, in a corner of a plot, and, at the time above specified, had attained to the following size:—it covered an oblong piece of ground twenty-seven feet in circumference. It sent forth seven main branches, which supported other sixty-one branches, five of which bore seed in 1842, and in September of that year the entire plant was in a healthy growing condition.

						Feet.	Inches.	
The 1st branch	bore	11	stems,	each		9	9	in length.
2d	"	"	8	"	"	7	3	"
3d	"	"	13	"	"	7	6	"
4th	"	"	15	"	"	10	0	"
5th	"	"	3	"	"	7	2	"
6th	"	"	10	"	"	6	0	"
7th	"	"	1	"		3	0	"

GUANO.

THERE seems to be a sort of *crisis*, if we may so call it, in the fate of this substance—whether it shall or shall not continue to be an article of commerce, and of practical use in American Husbandry. We shall submit, impartially, the testimony for and against it, leaving the reader to say on which side it preponderates. To us it seems, at present, to be decidedly *pro-guano.*—But we feel it to be our duty to premise, that neither from indolence, which leads us to snap at whatever saves us trouble, nor from want of due caution, should any farmer allow himself to be drawn into a neglect of the *materials to be found on his own premises* for manufacturing manure—and yet we must declare that such neglect is committed to a degree that is full of reproach and discredit, more especially to Southern Agriculturists. On this point, however, as on many other points of Husbandry, great reformation has taken place, and is going on, over that region of country—for even the dullest comprehension begins to perceive, that renewed applications of manure to cultivated fields is as indispensable (and on precisely the same principle) as daily food is necessary to *a cow that is daily milked!* and that in both cases the product will correspond with the quantity, and yet more with the *quality* of the food.

On this subject of the quality of food, as connected with the strength and value of the manure—believing that it cannot be too often or too forcibly impressed on the mind of the Farmer—we stop, in going along, to copy a striking passage, applicable to the general subject and connected with the one in hand:—

"The quality of animal dung materially depends upon the nature of the food habitually used. The richer and more nutritious it is, the greater will be the fertilizing properties of the emanations. Hence the dung of the race-horse is more valuable than that of the drudge released from the cart and kept upon low fare. For the very same reason the excrementitious deposits of birds, feeding upon fish or flesh, afford a stronger manure than parrots, for example, because the latter live only on grain and berries. Maize, during a great part of the year, is almost exclusively their food, and the ravages committed by them on the fields planted with it are extensive. Their dung, consequently, approximates more to that of the race-horse. If we could find out the excrementitious leavings of any other bird or quadruped, containing more ammoniacal compounds than Guano, and of which the supply is equal, then only should we possess an equivalent. This appears to be impracticable although it is a fact, analytically ascertained, that the dung of the boa-constrictor contains more ammonia than that of any other animal hitherto experimented upon."

The history of the introduction of Guano into the United States is worthy of being noted, to show the slowness with which new things are admitted into general use among Farmers; at the same time that its present popularity evinces the activity of agricultural inquiry, and the necessary and powerful force of the press in pushing, against every obstacle, a knowledge of the value of things, of which the existence would not otherwise be known. The extent and the manner in which that force was exercised during the last year, to spread a knowledge of the then recent importations and the value of Guano, is to no one better known than to us. The gentleman who contributed more than all others united to its distribution and trial, is, we may as well say, Mr. GEORGE LAW, of Baltimore, of whom it is but proper to add, that his exertions were purely and altogether disinterested.

Mr. Law has done for Guano what Judge PETERS did for *Plaster of Paris.* The same hesitation was evinced about the use of bone manure. When Mr. Hornby erected his establishment for grinding bones in this city about nine years since, he was under the necessity of making a gratuitous distribution of that material.—Farmers consented, with suspicious hesitation, to apply them—but the next year he sold 8,000 bushels, and thence the demand rapidly increased, recommended by its portability and its power, and bones that sold at first at five cents a bushel, went up to thirty! Yet there are thousands of Farmers in the United States who never even yet have seen or read of *bone dust* as a manure. And these are the very anti-inquiry, anti-reading gentlemen who would persuade us that there is *nothing to be learned from books*, as there was "*no good could come out of Nazareth.*" To return.—This extraordinary substance, which has, within the last eighteen months, attracted so much notice in this country—eliciting publications on its uses and qualities, until some of the most intelligent inquirres after, and diffusers of Agricultural knowledge are heard, at the very word *Guano*, to exclaim—"Enough—the very smell of it is enough!

'Give me an ounce of civet, good apothecary, to sweeten my imagination.'"

This substance, we repeat, which is general-

ly supposed to have been only last year imported into the United States, was received—two barrels of it—and distributed from the office of the old American Farmer as far back as the *Spring of* 1825—just twenty years ago! It was on that occasion that the Editor of this, the "Farmers' Library," by whom these two barrels were distributed, published an account of its use and value in Peru, together with a full analysis of it by two eminent French chemists, Fourcroy and Vaugelin, who were supplied with specimens for that purpose by Bonplase and Humboldt; Humboldt, by the bye, suggested the question, whether Guano might not be considered as the product of the revolutions of the earth, and to be classed with the formations of coal and fossil earth. Hence Guido Ricci proposed to give it a place in our mineralogical systems, under the name of Ammonique Uratée, (Urate of Ammonia,) or at at least to consider it as a natural product; and we know that, however well it may be considered settled that these immense deposits consist of the dung of sea-birds, there are captains of ships who have visited them who yet feel strongly persuaded that Guano is a natural substance, thrown up by some extraordinary convulsion or quake of the earth. Be that as it may, we refer, for the present, to the sixth volume of the American Farmer for the substance of all that has been since published as to the *mere use of it in Peru* —though we shall give a highly interesting "MEMOIR ON GUANO—ITS HISTORY AND USES IN PERU: BY WILLIAM WALTON," as soon as we can find room for it; and venture to say, that though he may now think the threat of it a rank offence, it will be read by none with more *gusto* than by a certain esteemed friend and *colla borateur*, just referred to as being already surfeited. "*Nous verrons.*"

That memoir on Guano, too, is one of those *foreign* essays, with which we shall test and, as we believe, gratify the taste of our readers for the literature, as well as the details of Agriculture. But to return to the use of Guano in the United States. As far back as, and we believe coëval with, the importation already spoken of, Commodore Stewart sent a quantity of it to Col. Monroe, then President of the United States, of which we have no report. At that time, and to the end of his patriotic life, we had the honor to enjoy the confidence and friendship of Col. Monroe, and we are by no means certain that the two barrels which came into our hands were not handed over by him for distribution. At all events, it was given to the late Robert Smith, President of the Maryland State Agricultural Society, and to Governor Lloyd, then the most extensive and among the most enterprising and intelligent Farmers in the Union. He reported that the effects of it as applied to Indian corn was remarkably favorable; but no measures were taken to procure any farther supply, and almost with the smell was exhaled the remembrance of Guano, until some four or five years since it was tried in Great Britain, on the small scale of a few bags. The demand has gone on increasing, with more diffused observations of its properties, until, as the reader may perceive, were it only on reading the following from the New-York Express of this morning, the Agricultural community is all alive about it.—By the bye, without confining the observation to *Guano*, how much quicker the English Farmer is to "snuff oppression in every tainted breeze," than his *brother Jonathan!* How long would English Farmers submit to a tax such as is levied here, on bird's dung, as a non-enumerated article in the Tariff?—a tax which, as will be seen by Mr. Bartlett's letter, threatens to put an entire stop to the importation of the article. The import duty in England is nothing, or next to nothing; and if our next Congress should not be engrossed by that spirit which has been aptly called the madness of the many for the benefit of the few, the duty will be repealed in this country.

"THE GUANO TRADE excites great attention in Liverpool. At a meeting of merchants on the 19th of May, a letter dated the day previously and written by Lord Stanley, stated 'that the charge in question for taking Guano from Malaga Islands was originally enforced by the authorities at the Cape, on the ground that the Guano discovered in the bay was the property of the Crown, and to remove all doubts on the subject he said an ordinance had been enacted by the Legislature of the Colony, under which the license fee had been demanded; but in deciding upon the confirmation of that ordinance, Her Majesty's Government would not fail to bestow their best attention upon the objections made to the imposition of the charge.' It was mentioned incidentally at this meeting that upwards of £50,000 was involved in Liverpool alone, upon the solution of this question, and that there are several houses interested to the amount of £2,000 and £5,000. Eventually a deputation was appointed to proceed to London to wait upon Lord Stanley, with the view of impressing his Lordship with the absolute necessity of abolishing the license fees, if the trade is to go on.

"A representation was made to the Colonial Secretary to the effect that the Guano at Ichaboe being exhausted, vessels in the trade now proceed to Saldanha Bay, but they were not allowed to take away the manure without a license from the authorities at the Cape of Good Hope, for which they were required to pay at the rate of 20s. per registered ton of the vessel. This imposition, it was alleged, amounted to upwards of 20 per cent. upon the selling price of the article in this country, and, in consequence of its being of an inferior quality, the importers were not able to realize the costs; therefore, as a means of relief, they desired the abolition of the license money."

The aggregate of all that we have seen goes to show (and we had as well mention it here as elsewhere) that the climate of England is better

adapted to develop the agency of Guano than is the climate of the United States. In Peru, the aboriginal savages, as white men, in the ascendant, are prone to call all people whom they conquer and plunder, had built up great canals and works for irrigation, and had carried Agriculture and Horticulture to a high degree of improvement. Hence it was that *there*, though the climate is much more arid than ours, Guano was considered indispensable to the subsistence of the Peruvian population; for there they had the means to *irrigate* the crops whenever the Guano was applied. In England, on the other hand, the humidity of the atmosphere and their exemption, generally, from drouths, supply the place of irrigation; while in this country we enjoy not the means of irrigation, and are at the same time exposed to terrible drouths. And this, it is obvious, is one of the causes which this year has operated most inauspiciously for the use of Guano, begetting danger that what has been the result of the most extraordinary drouth almost ever known at that season of the year, when it should have been acting, may be ascribed to inertness or inherent worthlessness in the article itself, causing it to be totally condemned and rejected; for we cannot claim more than other nations that sedateness of character which should restrain nations as well as individuals from running suddenly from one extreme to the other.

With these preliminary observations, we proceed to submit the most recent notices and communications which have fallen under our notice —not having time or space, were it otherwise expedient, to turn to the foreign magazines, which are full of experiments to ascertain the value of Guano in itself, and as compared in every form of use, and result, with other manures. And first, from the June number of the SOUTHERN PLANTER, published at Richmond, Virginia:

"GUANO.—I wish to state the following facts for the benefit of the Agricultural community:

"This Spring I purchased of Messrs. Williams and Haxall a lot of Guano, which I applied as follows: I mixed Plaster with Guano at the rate of two measures to one, and applied of the mixture ten bushels to the acre on wheat. This was during the drouth. I afterwards repeated the application twice during a rain upon the same land, and up to this day I have not perceived the least beneficial effect from it. I also soaked some of my seed oats in brine and rolled them in Guano, without being able to perceive that it produced any effect at all. I also mixed it and applied it to corn in the hill, after the manner recommended by Mr. Petticolas, in the Planter, with a like result. In short, I feel constrained to say, that in my case the money and labor expended on Guano, have been entirely thrown away. JOHN MACKENZIE."

We stop here to transcribe from the American Farmer, vol. 6, page 316, 1824, what might perhaps better have come in previously. The extract is a translation from "*A Voyage to South America, by Don Antonio de Ulloa*," vol. 2, page 99. He says:

"This manure, used in the fields, sowed with Maize, and with proper watering, is found greatly to fertilise the soil, a little of it being put close to the stem and then watered. It is also in use in fields of other grain, *except Wheat and Barley*, and consequently prodigious quantities of it are used yearly."

In corroboration of the above statement, Mr. Bennet, near Brooklyn, a very industrious and intelligent farmer, told us yesterday that with potatoes and some other crops this year it had destroyed the seed, but he believed it was because he had used an over dose.

We next call up friend Tatum, of the Farmers' Cabinet, as truthful a man as lives, and very discreet withal:

"In walking one day last week, over the farm of Samuel S. Richie, which lies some eight miles from this city, and a mile east of the Germantown road, we were highly gratified with its general appearance, and with the proofs over every part of it of the close attention and good management of the owner. His lot of wheat—five acres—was really splendid, and the best we have seen this spring, unless it may be rivalled by William R. Tatum's field of fifteen acres, at Woodbury, N. J. The lot had wheat in it last season, and produced a miserable crop. All parts of it were manured last fall, either with Poudrette, Guano, Charcoal from the sugar refiners, refuse from the glue factory, or with Salt. These applications are now on their respective portions, doing credit to themselves, to the evident satisfaction of the farmer. He mentioned a little anecdote, which shows at any rate that there is virtue in Guano. While he was applying some this Spring on another part of his farm, one of his neighbors came along and ridiculed the idea of looking for a compensating return for such an expenditure. After he left him, he took a very small quantity—say half a pint—into the middle of his neighbor's oat field, which was near by, and strewed it round, so as to make on the ground, in large size, the initials S S R, of his own name. The editor accompanied him to the spot, and there were the letters in bold relief, shown by the rank growth and dark color of the oats, as plainly and distinctly as they appear on this page."

EFFECT OF GUANO, AS NOW EXHIBITED IN MARYLAND, ON WHEAT AND OATS.

SANDY SPRING, MONTGOMERY CO., MD., 5th Month 1st, 1845.

Esteemed Friend:—I have to report that my Guano experiments increase in interest as they advance to fruition. The first experiment on an acre of wheat, is likely to surpass even my most sanguine expectations. It is the most luxuriant growth I ever saw, to be so uniform and even in height, and regularity on the ground. The average height is from five to six feet, with heads quite in proportion. About two and one-half bushels was sown to the acre, but I am now satisfied another bushel might have been added, and the yield been in proportion greater. Not less than fifty persons have examined it; of these a large proportion were from Maryland, and some from the District, and Western

Virginia, and all pronounced it the finest and largest they have seen.

"One swallow does not make a summer," neither should a single experiment in Agriculture, whether adverse or otherwise, decide the matter definitely; but in no instance yet, has the Guano failed with me, to produce the most marked and decided advantage.

A strip through my oat field, of about forty feet wide, was sown with Guano at the rate of two hundred pounds per acre, and the adjoining land, (side by side,) with sixteen bushels of ground bones. All sowed alike, as near as could be, and at the same time; the part with Guano is now about twice as luxuriant as the other, and the color a much darker green.

I have used the Guano extensively on my corn, but the crop, (as is nearly all in this vicinity; some, I understand, have determined to mark off and replant the crop,) has been so injured, I may almost say destroyed, by the bud worm, that little effect is seen from the Guano. The appearance of the corn crop is not now near so good, as it was three weeks since. In addition to the bud worm, most of the corn planted in low situations was killed by a hard frost, which occurred the night before last; not "bit by the frost," merely, but killed outright.

Please ascertain of friend S. K. George, and inform me whether he, or friend Bartlett, can promise with certainty another supply of the pure Peruvian Guano, from the Chincha Islands, in time for our wheat crop; say by 1st September. I am sure the present crop will twice overpay me for its use, and I mean "to try it again," without the formality of "picking the flint."

In haste, I remain respectfully thy friend,
(Signed) EDWARD STABLER.

(From Hon. James A. Pearce, Senator, U. S.)

CHESTERTOWN, June 12, 1845.

GEORGE LAW, ESQ.—

Dear Sir:—The Guano which I purchased through you, in March last, has been applied to grass, wheat, oats and corn, in proportions varying from 120 to 300 lbs. per acre. I have supposed that you might be desirous to know with what effect, and therefore send you a brief statement. My first experiment with wheat was made in March, just after the heavy rains, and was followed by a long and severe drouth. 120 lbs. Guano, mixed with 80 lbs. plaster and 2 bushels coal ashes, was sown broadcast on one acre of wheat, the soil being the poorest and most silicious on my farm. The wheat has been somewhat improved, but the result is not striking.

The second trial was with oats. The ground having been previously plowed, 360 lbs. Guano, mixed as before, was sown on 1¼ acres, and immediately harrowed. Four days after the oats were sown, and harrowed in. The soil was generally an exhausted loam, one corner of the piece being a clayey hill side, with some gravel, and no otherwise improved than by a liming of 60 to 70 bushels to the acre last year. The oats are now better on the adjacent land, which was heavily manured last year for corn.

On the 20th of April I sowed 120 lbs. Guano, mixed as before, on 2-5ths of an acre of growing wheat—the soil naturally a good loam, but exhausted by long tillage. The wheat here is greatly improved—its color soon became much darker—the straw longer—it branched more, and the heads are nearly twice as large as those of the same kind of wheat on adjoining land, which was heavily ashed two years ago.

The young clover, too, is much finer on the guanoed piece than elsewhere.

My corn was guanoed on the 26th May, and as yet no effect is perceived, nor is any expected until we shall have a rain, for which we are suffering greatly.

So far, I am much pleased with the Guano, and am disposed to make larger use of it this Fall. Can you tell me whether any further importations into Baltimore may be expected this summer.

Very respectfully, your ob't. serv't.,
(Signed) J. A. PEARCE.

I have said nothing of my orchard grass, or clover, to which the Guano was applied, because *all* the land was guanoed, and no comparison could therefore be made; but I am satisfied that the Guano was of great service, as the crop was decidedly better than last year's.

PETERSBURG, June 13, 1845.

MR. GEORGE LAW—

My dear Sir: Our friend Mr. Pleasants has shown me your letter making enquiries as to the results of *our application* of Guano. This has been the most remarkable year and the most unfavorable for the success of that manure which could have occurred. During a part of the months of March and April, we had a drouth of six weeks, in which time the earth was never wet, and accompanied with cold north winds and frequent frosts. At this time we are suffering with a drouth of five weeks, a part of the time very cold, but *now* oppressively warm. On the 25th ultimo we had a frost which cut down all my field peas, (which had been resowed several times,) potato tops, and a good deal of corn. Under these circumstances you can see that Guano in the general way could not do much. The effect on tobacco plants, which were kept watered, has been astonishing, and also on cabbage plants and other garden vegetables which were not permitted to get too dry. I applied it on a piece of meadow last August at the rate of 200 lbs. to the acre and the effect during the whole Fall was very striking, and is still a fine growth, but the use of it this Spring on grass has not been so satisfactory, owing, no doubt, to the season. I used it in the same quantity early in May to the red-top or herds grass combined, with two bushels of plaster; in the course of two or three days it rained and for several weeks the guanoed portion far outstripped that on the adjoining lands. As the present drouth continued, however, it has fallen back and I can now see no difference between them.

With regard to the use of Guano on wheat I will state that the 23d October last I applied it just as the wheat was fairly out of the ground to three respective portions of sand, all joining, so that I could compare them—one with Guano alone, at the rate of 200 lbs. per acre—one containing 2½ bushels of plaster with the same quantity of Guano, and one with a like quantity of Guano and 2½ bushels of dripped ashes.—The whole of these lots gave a decided improvement over the contiguous wheat without there being any decided difference between the respective portions themselves; as the Spring drouth came on, however, the benefit of application gradually subsided as far as the eye could detect it. I made another application in April

which produced a green and vigorous growth to be seen at a considerable distance; this too appeared to lose its effect in a measure as the dry weather set in and as the wheat ripened. I think, however, there is some difference in its favor—I have cut it to-day and shall try and ascertain its comparative gain and will then write you the result.

I am very sorry to find that nearly all my young clover has died out under the hot dry sun of the last two weeks, but I think it is much worse where the Guano was applied. As far as my experiments have *gone* I consider Guano a most powerful stimulant and fertilizer, under certain circumstances. If there should be showers of rain or the land kept moist in any way it is valuable, otherwise it may even do injury. I have not yet used any to my corn, *but shall* do so and let you know the result. Mr. Stabler's experiment has been a very favorable one. Was the drouth as severe with him as it was generally through the country?

Yours, truly. (Signed) W. I. DUPUY.

PETERSBURG, Va. 13th June, 1845.

Esteemed Friend: Since I had the pleasure of receiving thy favor of the 7th, which reached me two days ago, I have visited some of my neighbors to ascertain as far as possible what had been the effect of Guano on their crops. The character of the season has been more unusual than any we have had, perhaps since 1816. What with the frost in the first instance, and then the drouth, (which yet continues,) vegetation is exceedingly feeble; and neither Guano nor any other manure could have its full effect. Such seasons, however, are perhaps less disastrous on wheat than any other crop. I can recollect that 1816 was a great wheat year; and I have heard the old people often say that in 1806, when there was no rain from early in April till the middle of September, and when the ears of wheat hardly emerged from the boot, there was a bountiful crop. The harvest in this neighborhood is now about being completed, and the crop appears to be a fair one. As far as we can judge at present, the Guano has produced a marked effect in every case, where it has been applied, but one. This being one of Dr. Dupuy's experiments, he will communicate it to thee, as he is also writing by the same mail with this. His other experiment, considering the lateness of the season when the Guano was laid on, may be regarded as very favorable. The experiments of Robert Strachan, which I have mentioned in former letters, are altogether satisfactory to him. Some time since he expressed the opinion that the increased crop would pay for the Guano three times; and he informed me yesterday he had yet no reason to change his views in regard to it. His crop had been just harvested, and put up in hand-stacks on the land; and as far as could be judged from appearances he will not be disappointed in the estimate he formed. On oats, there is a very beautiful experiment on the farm adjoining me. Indeed, I have seen no kind of crop on which the Guano acts more energetically than on that of oats. I confess, however, I have seen nothing that can be at all compared with the wonderful effect upon Ed. Stabler's wheat, as described in his letter to thee; for the copy of which I feel much obliged. I had heard of it indirectly some time since; and a few weeks ago there was a letter from E. S. to J. S. Skinner, published in the Agricultural department of the Albion. I cannot account for the extraordinary growth, but by supposing that there had been plenty of moisture. It will be highly interesting to ascertain the product, though I cannot agree that it would have been proportionably increased, if he had used 3½ instead of 2½ bushels of seed. If it had been thicker the ears must have been smaller. My experiments have been very diversified, and on almost every kind of vegetable usually cultivated in market gardens, and though in some few cases of rather recent application, the effect has been inconsiderable, owing to the peculiarity of the season, yet altogether I have reason to be highly gratified. On Irish potatoes nothing could act better. Applied side by side with the best manure, at the rate of 300 lbs. of Guano and more than 100 cartloads of manure to the acre, the guanoed potatoes came up sooner and much better, and grew off more rapidly. The difference was very great for a long time, though it is less obvious now, the manure retaining moisture during the drouth. I shall ascertain shortly what will be the comparative product: as yet we have only dug the guanoed, which are very fine, and the yield very abundant. In addition to the Irish potatoes, I have tried the Guano extensively on the sweet potatoes. It is too early yet for it to manifest itself decidedly, but the vines are of good color, though small. For raising all kinds of plants for transplanting, such as cabbage, celery, tomatoes, tobacco, &c. it is superior to any other manure. The beds require less picking, which is a tedious operation. I prefer to apply it frequently in the form of a weak solution; but with seed of strong growing plants, such as cabbages, radishes, and the like. I prepare the beds by sowing the Guano broadcast, at the rate of 300 pounds to the acre, then chop it in, and afterwards rake in the seed. In that quantity I have not found it to impair the germinating powers of the seeds. I have succeeded worse with melons than any thing else; though with cymlius on a somewhat moist piece of ground, it has acted finely. The melon vines, however, are improving; and when the rain comes I hope they will make good progress. In a nursery of young peach and apple trees, the effect has been as decided as on any other growth whatever. The ground on which they grew, is very thin, and from the pale, sickly color which most of them exhibited last summer, I apprehended they would not come to much. But, since the application of Guano, the color has changed to a dark, rich green; and the young shoots have put out with great vigor. On cabbages I have not yet tried it, my early crop having been manured in the Fall and Winter; but I have a good deal of land prepared ready for being set out with plants for Fall and Winter cabbages, as soon as there comes a season. On early planted corn, on moist land, the Guano shows itself very well, but not with late planted on high land. In fine, considering the character of the season, the results are in almost every way satisfactory, and my confidence in its virtues is undiminished. Nevertheless, I hear some people cry out against it, and represent it as valueless.

In the last Southern Planter, there is a communication from a gentleman who states that he has made various trials, and in every instance there was no perceptible effect. He does not state from whom the Guano was obtained. [On reference to his article, I find I am mistaken:

he obtained it from Williams & Haxall, though I don't know of what cargo.] But in the face of such a cloud of witnesses, I am at a loss to perceive how any intelligent man can risk his reputation by publishing it as worthless. That there will sometimes be failures, may very readily happen. I have experienced them myself; and I have sometimes found the best manure to lie in the ground entirely inert, without being able to account for it. Colman, in his last number, acknowledges there have been failures in England: the only wonder is that with a new and powerful article the failures have not been more numerous, from injudicious applications,—the testimony in its favor could not well be stronger. In a previous letter thou made some inquiry as to the best time for applying Guano to corn. In one of the discussions of our Agricultural Society, I submitted the inquiry, in the hope that some member might be able to give a satisfactory answer, by refering to the action of other manures. One of our best farmers stated that he had frequently applied well decomposed manure to corn, when it was in the shoot; and even in silk and tassel, the effect had always been to increase the size of the ear without adding to the growth of the stalks. He added that he had been surprised at the prompt action of manure applied so late. Without any experience on the subject, my opinion is that there should be two applications to corn: one at the time of planting or weeding, enough to give the young plants a start, but not to force them too much; and the other about the time of shooting, or a little before, according to convenience. His is the Peruvian mode, and it is not likely that we can adopt a better. I have heard of several persons who have condemned the use of Guano on tobacco beds. To show how easy it is to raise tobacco plants in a manner entirely different from the old way, I will give the experiment I made. A tobacconist in Petersburg having some very rare tobacco seed, requested me to sow them for him. On the 1st of May, I selected a piece of old but rather moist ground, reduced it to fine tilth, but neither manured nor burned it. Having previously prepared the seeds by sprouting them, I sowed them on the bed, and in a few days they began to come up. I did nothing but apply a weak solution of Guano about twice a week, and keep the bed clean; and by the end of May there were some plants large enough to set. I have never seen a more flourishing patch.

As the season advances I shall be very happy to communicate with thee, and exchange such information as we may acquire.

I am most truly thy friend.
(Signed) T. S. PLEASANTS.

To GEORGE LAW, Baltimore.

[Communicated to the Farmer and Mechanic for publication.]

AMERICAN INSTITUTE,
New-York Farmers' Club, June 17, 1845.

Col. EDWARD CLARK in the Chair.

So much of the minutes of the last meeting was read as related to the question of Culture of Corn.

Mr. Meigs read the following letter from William B. Oddie, Esq., of Rockland:

ROCKLAND, June 9, 1845.

H. MEIGS, Esq., Sec'y:

Dear Sir: I have used Guano in a liquid state to steep seed in, and find it far before any preparation of salt-petre, ammonia, &c. For corn there is no thing better. I planted a new piece of ground, plowed it for the first time this Spring, and dropped the seed, after allowing it to soak two days in the above mixture, and found that it came up four or five days before corn planted at the same time without Guano being used. The color of the leaf is a deep green and the stocks stout, and, notwithstanding frost and drouth, grows rapidly. I used one pint of Guano to four gallons of blood-warm water, immersing the grains, after straining well. You would be astonished to see what an admirable emetic it is for the crows—they have visited the field once, but requiring no more medicine they have since kept aloof—the best scare-crow extant. I believe that Guano, used as above, has the temporary effect of giving the plant a fine impulse, when, as its roots distend, they have the good old fashioned stable, cow or hay manure to sustain them. Yours, respectfully,

WM. B. ODDIE.

On the question of its *permanency* (an important point,) we took occasion, in the delivery of a discourse in September last, at Wilmington, Delaware, to remark:

"It may be fair to presume, however, from the promptness and energy of its action, and the very moderate quantity usually applied, that it will not be so enduring as a heavy dressing of putrescent manure."

But against that apprehension we find in Mr. Colman's last Report he says:

"It has been questioned whether its effects will be permanent. I can only answer, that I have seen its obviously beneficial effects three years after its application, upon grass. How much longer its efficacy may be expected to continue, experience only can determine."

The cases of application this year have been sufficiently numerous and variant, and the effects, it is to be hoped, noted with sufficient exactness to settle the question beyond all dispute at what price it may be expedient to use it. Any manure of a portable nature and condensed efficacy, must be very valuable as applicable to tobacco and other *plant beds*, where the embryo, as it were, of large field crops are to take their first growth within a very small space. Might not planters of tobacco contrive *always* to have plants by watering their beds with a solution of Guano, or of the sweepings of pigeon and poultry houses? But nothing can be done out of the common track without some personal energy and perseverance. The half very often consists in *beginning to do a thing*.

WALNUTS.—I beg (says Juglans) to call the attention of the public to the advantages of planting those ornamental and productive trees, the wood being very valuable. With regard to culture, sow the nuts in beds, which should be kept free from weeds, and at the end of three years plant finally 160 trees to the acre. Walnuts will grow in the poorest soil, and mixed with the forest trees form good belts, &c. In the tenth year they will begin to bear, and taking the average produce per tree at only one bushel, the value of which is 10s., they will give £80 per annum for the acre; deduct 6d. per bushel for picking, and £2 a year for the land, and it will leave £54 of clear profit. The expense of planting, first cost of seed, and every expense included, will be about £2 per acre.

[English paper.

SOUTHDOWN PRIZE WETHERS,

Exhibited at the Smithfield Show

New York Published by Greeley & McElrath for the Farmers Library. J. S. SKINNER, *Editor*

SOUTH-DOWN SHEEP....FORM AND QUALITIES.

We shall endeavor to present to the patrons of "The Farmers' Library and Monthly Journal of Agriculture," the true forms and properties of the various species of Domestic Animals —not with an air of exaggeration as a fancy sketch of the perfection to which they might be brought, but as a genuine picture of the best, such as skill and care have actually made them, in countries where they are supposed to have attained their highest degree of improvement.—The object is, that the farmer may have before him a standard of attainable excellence, up to which every man of proper pride will endeavor to bring his own; for as little can be hoped for from a farmer without pride, as from a soldier without ambition, or a housewife without cleanliness or diligence.

The selection, for the first number, of portraits of South-Down Sheep, was not to indicate any partiality for that over other breeds; it was rather a matter of chance. All other breeds, which may be regarded as well adapted to the peculiar circumstances of any considerable district of our country, will, in turn, be in like manner illustrated, and their properties impartially described.

The portraitures given in this number are found in an English work of authority and great research on Wool, Woolens and Sheep, where they are given to represent three South-Down Wethers of Mr. Grantham, exhibited at the Show at the Smithfield Club in 1835.

In the work before us, it is stated that the average dead weight of the South-Down Wether varies from 8 to 11 stones; but Mr. Grantham exhibited a pen of three in the Show of the Smithfield Club, in 1835, one of them weighing 20 stone 3 lbs., a second 20 stone 6 lbs., and a third 21 stone.

From the same work we take, as characteristic of this breed of Sheep, as follows:—

"The next is the hill sheep, adapted to more elevated situations and shorter feed in the natural and permanent pastures; able also to travel without detriment a considerable distance to the fold and to the Downs. There can be no hesitation in fixing on *the South-Down* as the model here.

"The following is the substance of the description of this sheep by Mr. Ellman, who, if he may not be considered like Mr. Bakewell with regard to the Leicester, as founder of the breed, yet contributed more than any other man to its present improvement and value.

"The head small and hornless; the face speckled or grey, and neither too long nor too short. The lips thin, and the space between the nose and eyes narrow. The under jaw, or chap, fine and thin; the ears tolerably wide, and well covered with wool, and the forehead also, and the whole space between the ears well protected by it, as a defence from the fly.

"The eye full and bright, but not prominent. The orbits of the eye—the eye-cap, or bone—not too projecting, that it may not form a fatal obstacle to lambing.

"The neck of a medium length, thin towards the head, but enlarging towards the shoulders, where it should be broad and high, and straight in its whole course above and below. The breast should be wide, deep, and projecting forwards between the fore legs, indicating a good constitution, and a disposition to thrive. Corresponding with this, the shoulders should be on a level with the back, and not too wide above; they should bow outwards from the top to the breast, indicating a springing rib beneath, and leaving room for it.

"The ribs coming out horizontally from the spine, and extending far backward, and the last rib projecting more than the others; the back flat from the shoulders to the setting on of the tail; the loin broad and flat, the rump long and broad, and the tail set on high and nearly on a line with the spine. The hips wide, the space between them and the last rib on either side as narrow as possible, and the ribs generally presenting a circular form like a barrel.

"The belly is straight as the back.

"The legs neither too long nor too short. The fore legs straight from the breast to the foot: not bending inwards at the knee, and standing far apart both before and behind, the hocks having a direction rather outward, and the twist, or the meeting of the thighs behind, being particularly full; the bones fine, yet having no appearance of weakness, and of a speckled or dark color.

"The belly well defended with wool, coming down before and behind to the knee and to the hock; the wool short, close, curled, and fine, and free from spiry projecting fibres."

Of Mr. Webb's sheep, referred to by Mr. Stevenson, and of the very ram he brought home with him, and which, unfortunately, it seems he has lost, we find the following notice by Mr. Allen in the Agriculturist, vol. 1, page 104, founded on personal knowledge and observation:—

"To give an idea of the weight of Mr. Webb's animals, the buck selected for Mr. Rotch, though only six months old, weighed 152 lbs. on the scales; Bishop Mead's, eighteen months old, 248 lbs., and Mr. Stevenson's, same age 254 lbs., while a wether, exhibited at Cambridge on Christmas-day, 1840, weighed, dressed with the head on, 200 lbs., aside from yielding 28 lbs. of rough tallow. The average weight of his wethers, however, at eighteen to twenty months old, is but about 30 to 35 lbs. per quarter. The bucks shear from 9 to 11 lbs., and the average shearing

of the whole flock is 6 lbs. 15 oz., and of a quality of wool that we thought better in the generality of South-Downs. The fleece is close and compact, and we should think would resist rain. sleet and snow, nearly as well as the best merinos."

Being aware that two of our most eminent citizens—Mr. Webster in the North, and Mr. Stevenson in the South—had both selected Sheep of this breed to bring home to America, we were naturally, as it will be admitted, curious to know what coincidence of views had prompted the choice of the same breed for regions of country so essentially different in most of the circumstances likely to influence a choice of stock Sheep. Accordingly application was respectfully made to both, in the confidence that they would be alike ready to state, as we knew they had been alike disposed to take note of whatever they could discover in the Agriculture of England that could benefit the landed interest of their own country. This explanation is given to show how it is that we have been so fortunate as to draw from Mr. Stevenson the very interesting letter which follows, quite enough in itself to justify our anticipations and to evince his deep anxiety for the redemption of the Agricultural prospects of his noble State. We will only add that, lively as is our sense of obligation for the promptness with which he has answered to the call we ventured to make upon him, we hope to be often subjected to the same impressions. Mr. Webster's engagements here in causes of great importance, left him no leisure to descant on topics more congenial to his natural temper; but when he shall, in July, get quietly seated under his umbrageous elms at Marshfield, we shall hope to have some kind friend there "takin' notes" of his observations on English Agriculture, as adopted and not adapted to the United States.—*We shall see.*

Correspondence with Hon. A. Stevenson.

Office of the FARMERS' LIBRARY,
NEW-YORK, 6th May, 1845.

DEAR SIR:—I persuade myself that in the subject of this you will find some excuse for the demand it is designed to make on your known partiality for Agriculture, as well as on your personal kindness. Circumstances beyond my control have driven me here to reside, where, I am sure you will be pleased to learn, I have found agreeable employment for all my time and anxiety, in the editorial management of a journal to be devoted impartially and exclusively to Agriculture. The design and plan of it is explained more particularly in the accompanying paper. It would not become me to ask your patronage of it, at least not until you can better judge of its merits by a sight of the first number; nor, indeed, at any time should I deem your patronage in any shape so acceptable and auspicious as in that of communications, such as your observation and experience so well qualify you to make. The most particular objects of this, however, are to bespeak an indulgent reception of the first number, and the favor of letting me know as to your South-Downs enough to constitute historical memoranda of the particular race from which they sprung, and the particular considerations which led you to the selection of that breed.

There are, I am aware, very strong attractions for sheep husbandry in Virginia. Will you permit me to inquire what you regard as the most formidable obstacles to its extension in that and more Southern States—especially in the vast extent of their more hilly and congenial districts, as such districts are known to be.

I made an earnest effort. before I left Washington, to get for the "FARMERS' LIBRARY" a portrait and memoir of that eminent promoter of Southern Agriculture, Col. John Taylor, of Caroline. With every courteous disposition on the part of his son, Mr. W. P. Taylor, to meet my wishes, they have been grievously disappointed. It was not that anything was necessary to revive my recollection of, or to augment my sensibility to, the value of his services; but I was desirous, by the renumeration of them now, to hold him up in a stronger light to the rising generations, as one of the greatest benefactors of the *land*—one of whom it may be said, as it may not of all good writers on Agriculture, that his zeal was not ahead of his practice—one who, in a word, stimulated men to *think*; without which no signal improvement is to be achieved in one art more than another.

I still cherish the hope of getting what may approach what I sought in reference to the author of ARATOR. Mr. Madison, too, of course will have a place in the Library as the President of the Albemarle Agricultural Society, and author of one of the best (if not *the* best) addresses from any friend of the cause.

I cannot forbear the opportunity to express my humble gratification at the formation of your State Society for the promotion of the Agriculture of your State. It will come in for a full share of attention in the periodical I am engaged to conduct. With science and experience as you have in the head, and such activity and intelligence in the members, of your Association, its ends must be accomplished. There is radical evil somewhere: it is time to probe it, boldly and fearlessly, and to look for the cure.

I pray you pardon me for troubling you with a more extended exposition of my undertaking than I had intended.

The first number will appear on the first of July, and will contain Portraits of South-Down Wethers, taken from Bischoff's work on Sheep

and Wool and Woolen Manufactures; and these portraits it is desirable to accompany with remarks on the peculiar qualities which adapt them, under certain circumstances, to the use of American Farmers.

With great respect and esteem,
I remain, Sir, your obedient servant,
J. S. SKINNER.

To Hon. ANDREW STEVENSON,
Vice President Virginia Agricultural Society.

THE RETREAT, near Richmond, June 16, 1845.

My dear Sir: On returning home, after an absence of some weeks, I found your kind letter, with the accompanying *Prospectus*, for the new Journal of Agriculture which you are about to edit. This was the first intimation I had received upon the subject, and I beg you to believe, that I was as much gratified at receiving your letter, as I shall be instructed and edified by your Journal, to which I most gladly become a subscriber, and now enclose in advance the first year's subscription.

Whilst you do no more than justice in regarding me as the warm and devoted friend of Agriculture, you greatly overrate my ability to render to it that aid which I should be happy to afford, and which many of my friends are pleased to anticipate. The truth is, I have neither the information, or time, to enable me to add much to be common stock of agricultural knowledge, and you must, therefore, set me down for little else than one of your constant readers; an occasional correspondent and contributor to your Journal; and one of its fast and devoted patrons. This is all that I have it in my power to promise, and so far I am willing to stand committed. I rejoice, my dear sir, to see you once more in the field "giving note of preparation," not, however, for *battle or slaughter*, but as the *friend* and *champion* of the arts of Peace. The laurel which entwines the *Hero's* brow is bathed in blood and wet with the tears of the widow and orphan, but the civic wreath of the *Husbandman* is green with his own woods unstained with gore, and unmixed with cypress. Go on, then, and devote your talents and labors to objects so worthy of them, and by which you will confer benefit as well as honor upon our common country. In this good work God speed you success.

Of the importance of Agriculture, in a physical moral, or political point of view, I need say little to you. If, with the wisest, the richest, and the most powerful nation, Agricultural pursuits have ever been esteemed the most honorable, as well as the most useful employments of man, how much more should this be the case in a country like ours, where the Institutions, Government and People depend so essentially upon their successful operation. Indeed, Providence seems to have decided for us the great question of preference, so long agitated by political economists. We are, and must continue, if we expect to remain free and prosperous, emphatically an *Agricultural* People. And does not self-interest, as well as patriotism, combine to stimulate us to the improvement of our systems of husbandry? What nation has ever existed celebrated for its advancement in civilization and the arts, in which the marked encouragement of Agriculture has not been admitted? And yet, what country on earth so deeply interested in its success, has shewn less attention to it than our own? The spirit of improvement has not only been suffered to languish, but its essential and vital interests, have been shamefully neglected. Who can witness, my dear sir, without deep mortification, the stream of emigration from the whole of our Atlantic border to the Western portions of our Union? How many persons do we daily see selling their farms at low prices and relinquishing their birth-places and friends to settle in the rich vallies of the West, from a supposed inability to support themselves on their poor and exhausted lands. Is not this the result of gross mismanagement and a continued perseverance in the old and wretched system of cultivation? How long are we to be doomed to this state of things? And are we never to profit from the experience of other nations? Whilst in Great Britain *nine-tenths* of the lands are leased to tenants who pay from 30 to 60 shillings sterling per acre, and find every thing for husbandry, they can even on these terms grow rich; yet we, (at least at the South,) without tithes or heavy taxation, and with numerous laborers, can barely make out to support ourselves from the products of our estates. I have seen it stated very recently, on the authority of some eminent British statist, that to supply the United Kingdom of Great Britain with the article of wheat alone, would take the employment of the whole British Navy; and to bring all their Agricultural Products, as now enjoyed, would take the navy of the whole world. To ascertain this, it would only be necessary to take the average consumption of each inhabitant, and multiply the annual amount by the whole number of the population. England, as you know, has been called a *garden spot*, and such it justly may be regarded, when with a territory not larger than that of New-York or Virginia, it can support a population nearly equal to that of the whole United States. It is alone by skill and industry that they resist the danger of excessive population pressing upon the means of subsistence, and thus enable them to supply an increasing population, not only with the same but a much better description of food from the same districts of country. Now, to what is all this to be attributed, but to *superior productiveness* occasioned by *superior cultivation*, and the addi-

tional fact, that they cultivate no more land *than they can manure and improve.* It was, I think, the late Lord Leicester [Mr. Coke] who once said that the great and prevailing error in English Agriculture was what he called over-plowing, and having more land under tillage than the quantity of manure would justify. This, I think, is one of the great evils in our system of cultivation. If, on the contrary, we were to limit our tillage to our supply of manure, what an increase of old and exhausted fields should we witness? and yet I am convinced that our planters and farmers would be in much better and more prosperous circumstances. Our rule, however, seems to be, that having so many laborers we must necessarily cultivate a great deal of land, whether it be rich or poor. This is one of the errors of our Agriculturists, and it therefore becomes important to convince them that means exist by which their poor lands may be fertilized and rendered profitable at much less expense, and by which their landed property, as well as the comforts of life, might be greatly increased; and that these means are in their own power. This is, doubtless, a subject which will command attention and engage your vigorous pen. I flatter myself also with the hope that your Journal will not fail to notice another important matter connected with the Agricultural interests of the Middle and Southern States. I mean the internal communication of the country and the transportation of our Agricultural Products. Our produce, until it reaches the market of exportation, does not change its character of interest. It is still the planters, and only becomes an article of commerce when it touches the hand of the merchant. The transportation, therefore, to market, is as intimately connected with its value as any process of its previous preparation, and the planter and farmer have, therefore, a deep interest in the improvement of the internal navigation of the country. To accomplish this, we shall require not only the aid of the press but the continued and enlightened influence of the whole Agricultural community. Indeed it should be borne in mind that in governments founded upon republican principles, national enterprises, to be successful, require the support of general sentiment and feeling. *Public opinion* must therefore lead while government follows, to organize the means of carrying into effect the popular will. It will need, also, the enlarged views and enlightened policy of our State Governments.

You ask me in your letter for some account of my South-Down Sheep, imported three years ago, and the reasons which led to their selection. I regret to say that I have been unfortunate with the lot. I had the misfortune to lose the buck and one of the three ewes soon after their arrival in the United States. I attributed the loss to the voyage. The result has been that I have now only the half breed. Concurring in the general opinion that the breed of Sheep, to be reared, ought to be selected according to the nature of the pastures and the artificial means of supplying food, I gave the preference to the South-Downs, over all the other breeds, for this section of country.

In selecting a mountain breed, for instance, for rearing in *low arable land*, the advantage would be lost of producing a larger and a finer class of animals; and so, on the other hand, if a low-land breed is carried to a mountain region, an evil of a different kind is committed, much more hurtful; for a fine stock would be ruined if placed in a situation where it could not be maintained. The South-Down I found adapted to most situations in the midland parts of England. Besides their beauty and fullness of form and propensity to fatten, they had patience of occasional short keep and an endurance of hard stocking, equal if not superior to any other sort, with an early maturity scarcely inferior to the best of the *New Leicesters*, and with flesh of an equally fine grain and flavor. They were, moreover, better suited to an extensive range of light soils, and to our natural and permanent pastures. Another reason, too, was their good and abundant wool, and their supposed hardiness and good health. These were the reasons of my preference for the South-Downs. I was particularly anxious in selecting to get a fine male sheep—I did this upon the ground that, as respects both cattle and sheep, the opinion was general and doubtless correct, that in most cases the qualities of the male parent predominate in the offspring, and the more indifferent and the worse bred the female was the more this would be the case when she was put to a well bred buck. I procured the ram and ewes from the folds of Mr. Jonas Webb, of Cambridgeshire, who, I think, is justly esteemed one of the most eminent breeders in England. He obtained at the Show of the Royal Agricultural Society of England, at Liverpool, in 1841, three of the highest premiums for his South-Downs, over all the competitors of the United Kingdom. Virginia has many advantages for breeding sheep, not surpassed in the United States. The middle part of the State, and especially the whole range of the South-West Mountains and Blue Ridge, afford the greatest facilities for fine *sheep-walks*. Hills covered with fine herbage, extensive enclosures, abundance of running water, and well sheltered by trees against the heat and sun of summer. But the prejudice which the late Col. John Taylor, of Caroline, (who, by the bye, did more for Agriculture than any man in America,) had against sheep, has been the means of rendering this description of stock unpopular in

many parts of the Southern country. You will remember that some years ago he expressed the opinion, "*that they consumed more food in proportion to their size than any other stock; that they were more liable to disease and death, and that they could never be made a profitable stock throughout the extent of the warm, dry climate of the United States, without banishing tillage from vast tracts of country.*" Now, without examining in extent this opinion, I think I may venture to say that this denunciation of this peaceful and valuable race of animals (from which we draw so many of the comforts and luxuries of life) is not concurred in by any large portion of American Agriculturists; and that if this distinguished patriot and statesman had lived at this day, he would have changed this opinion. But I must cry you mercy, and forbear. I have spun out this letter to an unreasonable length, and can only promise not to tax you in this way again. Under your auspices, and that of your distinguished and scientific colaborers, Agriculture, I trust, will soon rear her head and recover her vigor; and whilst Commerce plows the wave, Agriculture will laugh on the land, and Peace requite us at home.

Very truly and cordially, believe me, my dear Sir,
Your friend and ob't serv't.
A. STEVENSON.

To the Editor of the Farmers' Library.

SOUTHERN AGRICULTURE.

To the President and Directors of the "Virginia State Agricultural Society."

It was with no slight degree of pleasure that I received the pamphlet containing the "Constitution and Proceedings of the Convention for the Formation of a State Agricultural Society," at Richmond, on the 20th of January last.

This pamphlet, with the names it contains and objects set forth so clearly and forcibly, revives pleasing, sacred recollections of friends whose countenance to me has ever been warm from the heart. The name of Virginia itself recalls to mind many of the most illustrious ornaments of our history. The State which, with many other illustrious men, has produced a Washington, a Henry, a Marshall, a Jefferson, a Madison and a Monroe, may well claim a place among the most exalted communities of the earth. It must, therefore, be a source of sincere pleasure to every patriot, to learn that a spirit has manifested itself among the descendants of these great men to meet *their obligation of honor*—to call into action the abundant intellectual and physical resources of the *noble and variegated district of this Union* embraced within the limits of Virginia.

Let us pass, then, at once from the retrospect of what we can all feel, but which language is too poor to express, to cast a glance over the actual condition of a region so rich in all the natural elements of growth and prosperity. In my humble labors to advance the various industrial interests of our common country—beginning with the old American Farmer, in 1819—the generous public of your State have given me so many proofs of kindness and confidence, as to embolden me to offer to them this statistical retrospect, in some respects painful, but indolent acquiescence in them only can make the results humiliating. Gratitude to your citizens, as well as my position here, as the conductor of a work designed to form, in the course of its publication, a *Library for American Farmers*, conspire to enforce upon me the duty of frankness in whatever I shall from time to time venture to say, as I shall often say what occurs to me as best calculated to redeem the agricultural condition of the old tide-water States South of New-York.—The suggestions which may be made respecting Virginia, her resources and means of recuperation, will be applicable in a great measure to all the rest; let that be borne in mind as we proceed. The needful discrimination may be safely left to all intelligent and reflecting readers.

A high sense of moral and political right produced the Declaration of Independence. The sentiments, then a passion, though abated in their intensity, yet burn, and we hope ever will, in the American breast; yet their influence had produced different effects in different States, from local causes.

Virginia, from her commanding position, superior force, and the great intellectual elevation of her leading men, was naturally led to the examination of *great State questions*, and to overlook her material domestic interests. It was, of course, a consequence, that the policy of the State would become such as to render undue devotion and employment of mind and time to *party politics*. In a society so eminent as is that of Virginia for mental improvement and power, the discussion of any subject which should arrest general attention and strongly enlist the feelings, would naturally engross too

much of the time and withdraw the energies of the greatest minds from personal application to interests which cannot be neglected with impunity. That most vital interests have been neglected in your State, is matter which cannot be denied, however much regretted; but when we direct attention to the causes of that neglect, we cannot but express high respect for the generous feelings of the people. That Virginia has not advanced, in either population or wealth, in proportion to other States of the Union possessed originally of less natural advantages, must be admitted; and devoted as has been the heart and hand of him who addresses those whose friendship he warmly cherishes, they cannot take amiss his advice to *look their actual and comparative situation firmly in the face.* The formation of your Society, we may hope, as I before said, is the foreshadowing event of a most salutary change, a counter-revolution which may restore Virginia to the rank in the confederacy which is due to her from relative extent of territory, and more particularly from *relative position.*

If her soil has been exhausted by improvidence, the materials are at hand to restore it—of this truth you have been most ably advised by your distinguished President—but in that respect she does not suffer by comparison as much as is generally supposed. In the last volume of the New-York State Agricultural Society, you will see it stated by its zealous and efficient Secretary, Mr. O'Reilly, on authority not questioned or questionable, that such had been the depreciation of the wheat crops, owing to *exhaustion of the soil,* consequent on ill-judged farming, that the product of wheat lands between Seneca Lake and Niagara River has not, for the last three or four years, *exceeded the low average of eleven or twelve bushels per acre!* Indeed, he had authority for declaring that in reference to a single county (Seneca) possessing unsurpassed natural capacity for producing wheat, the average yield is now not over *ten* bushels per acre, on lands which twenty years ago freely yielded twenty." Is the wheat crop better, asked Mr. O'R., any where in Western New-York than in Seneca? Thus, Farmers of Virginia, you see that other States have been running the same career of improvident cultivation that you have, and with like results, "always taking out of the meal-tub, and never putting in, will soon come to the bottom," is a simple illustration by a wise man that any fool may understand; but while your generous nature will forbid your deriving any consolation from the knowledge that others have been in their agricultural practices as incautious as yourselves, it behooves me to draw your attention, as I shall in some early future number of the Farmers' Library with some minuteness, to what is now doing in New-York to arrest the progress of agricultural exhaustion, to enable her to hold on her course of rapid growth in all that gives population, wealth, power and political predominance to States. To return, now, to Virginia.

The most valuable of her unbounded resources remain; for there are yet her spacious bays, fine navigable rivers, her inexhaustible beds of iron, coal, and beds of shells and marl, her internal lakes of salt water, her forests and diversity of soil, and central position on the Atlantic coast, with more than ordinary temptation and facilities for internal improvements. But, as we before said, there are other States than Virginia interested in the views we shall present, for such a member, bearing so large a share in the national mass, cannot advance or recede without affecting the whole body politic. In one connexion her interests and fate are identified with all whose staples are the same and produced by the same species of labor.

The subjoined tabular data will serve to show the wide field of enterprise presented by Virginia, not only to her own citizens, but to emigrants who pass by the advantages there offered, to seek far less certain comfort and fortune in the central or more distant section of the Continent. With some intermingling and identity along the lines of separation, Virginia is divided into three natural divisions: the *Eastern* or alluvial, the *Central* or mountainous, and *Western* or Ohio section.

Time and space do not allow us to compile and present (as it might better answer the purpose in hand, to do) the population of *each County,* of each Division at the several periods; but taking, first, the alluvial or "Lower Virginia," embracing thirty Counties, and it will be found that they contained a population in 1810 of 258,246; in 1820, 260,524; and in 1840, a population of 273,240—being an increase of only 14,994 in a period of thirty years.

Here, then, we have a section of Virginia, comprising an area of 8,875 square miles, of the most anciently inhabited part of the State, on which the population is distributed at the rate of very little more than 30 to the square mile, and on which the ratio of increase was only 1.05—one and one-fifth per cent.—*in forty years.*

It would be difficult, if not impossible, to find another equal surface of the earth—so abundantly supplied with navigable bays and tide-water rivers. Here, too, opens, in many respects, the finest bay of the American coast, from Cape Horn to Labrador. It would be in vain to ascribe this phenomenon in human population to any defect of the soil, or insalubrity of the climate. In an early volume of the American Farmer, it was shown that in a certain area of a tide-water eastern shore County of Mary-

land. (Talbot,) was to be found the greatest aggregate age in a like extent of equal population, probably, in all the Union. It would be hazarding nothing to assert, that with its soil and facilities of navigation, the surface of these alluvial Counties would not (with a skillful exercise of human industry and talent acting on its resources) be crowded in conveniently, with a five-fold greater number, or, with 1,300,000 inhabitants!

To blink these views would be about as wise as the whistling of the boy to keep off ghosts as he rides along, unexpectedly benighted, by an old country church-yard.

Let us now take up the Counties which constitute strictly *Middle Virginia*—embracing 36 Counties. Of these the population, in 1818, was 447,547; in 1820, 486,555; and in 1840, 510,930.

Comparing the population of these Counties, as it stood in 1810, with that of 1840, and also with that of the intermediate year 1820, we see how slow was the increase even where there was any, and in some of the Counties there appears to have been an actual decrease between 1820 and 1840! It is true that in some cases these diminutions have arisen from division of Counties, but the general results, however, are in no serious manner affected. The ratio of increase during the same period of 30 years from 1810 to 1840, was here, again, but 1.14 per cent. and, what is yet more significant of decay, (for in such cases, with your neighbors pressing forward, *to stand still is to go backward,*) the ratio of increase during the last period of 20 years from 1820 to 1840, was only 1.05, corresponding with that in Lower Virginia in the period of 30 years from 1819 to 1840.

Assuming the population in the aggregate of these thirty-six Counties in Middle Virginia, on an area of 24,300 square miles, to amount now, in 1845, to 534,600, and the distributive population would then be only *twenty-two to the square mile!*

The area of England has been variously estimated at from 50 to 57,960 square miles, and its population, according to the census of 1831, was 13,894,569, and in 1841, according to the latest authority within convenient reach at this moment, was estimated at 16,000,000. Supposing England and Wales, then, to have a population at this time, of 16,500,000, as we may, and the square miles to be 55,000, and we have a population of 300 to the square mile—with about one-fourth part of the soil estimated yet to be uncultivated. All Europe, with a population of at least 250,000,000 on a surface of 33,000,000 square miles, sustains about 75 to the square mile. These comparative views are given to show the vast capabilities of Virginia; but how do the navigable rivers of England compare with those of Virginia? Take into view the entire extent of Europe, and there is no risk in estimating *Middle Virginia* as capable of sustaining a more dense population than now exists in Europe, surface compared with surface; but even with 75 to the square mile, and an aggregate arises of 1,822,000.

Take, now, the 52 remaining Counties, composing *Western* Virginia, and they present an aggregate population in 1840 of 432,855. The progressive population of these Counties could not be given, because in the period from the first census down to 1840, such have been the extensive changes of old Counties and the creation of new ones, as to preclude any analysis.

West Virginia comprises an area of 28,000 square miles, which, divided by 52 counties, gives to each a surface, within a very small fraction of 500 square miles, and her distributive population is 15 to the mile.

SUMMARY OF ALL VIRGINIA,
DIVIDED ONLY INTO EAST AND WEST ACCORDING TO THE CENSUS OF 1840.

Sections.	*Whites.*	*Colored.*	*Area in sq. m.*	*Pop. in sq. m.*
East and Mid. Va.	369,398	437,544	33,175	30
West Va.	371,570	61,285	28,000	15
Total,	749,968	498,829	61,175	*av.*..20
Total population.	1,239,797			

The very unequal distribution of the colored race, on the two great sections of Virginia, must strike every one whose attention is turned to the subject. The very thin general population is, again, a far more serious matter. We have already shown, over the State, that every individual counts against thirty acres of land, very nearly. To cure any evil it is necessary to look it fearlessly in the face. As Burns says,

> "O wad some Power the gifte gie us,
> To see ourselves as ithers see us."

The subjoined tabular view ought to carry its lesson in solemn admonition to more States than Virginia:

The States which border on Virginia are—

	Area in sq. m.	*Pop. in 1840.*	*Pop. to sq. m. in 1840.*	*Acres to indv.*
Maryland,	10,800	469 232	42	14
Penn'a,	43,950	1,724,033	40	16
Ohio,	39,000	1,519.467	38	15¾
Kentucky,	39,000	779,828	20	31
Tennessee,	44.000	829,210	19	33¾
N. Carolina,	43,800	753,419	17	37
Totals,	220,550	6,075,189	*av*...24	23

But remember how lately Ohio was under Territorial Government. In 1800 her whole population was but 35,365, while that of Virginia was 880,200. In 1840 the population of Virginia had risen to 1,239,797, when Ohio had gone up to 1,519,467. What must have been, during that time, the appreciation in the value of her lands! Maryland, nearly resembling Virginia in her laws, policy, institutions, and the nature of her natural advantages and resources, has in *fifty years* increased but 160,000.

and that almost exclusively in Baltimore, and in that portion of the State resembling Western Virginia, where her accumulations have also occurred. Her tide water country, taking 8 or 9 counties on the Eastern Shore, has actually retrograded in the last thirty years.

The elements here presented carry their evidence and conclusions so clearly with them, that comment is unnecessary. If we add the extent and population of Virginia to the foregoing, we have a connected area so near that we may assume it at 282,000 square miles, on which, in 1840, there was found an aggregate population of 7,314,986—or only 25 to the square mile. The land surface of the earth would be examined in vain to find another superior region, in all that nature presents for cultivation and use, to the human head and hand. We may at once assert that three-fold of the existing population of the whole United States might be placed on the space before us, and, under wise policy, enjoy more physical, moral, and intellectual advantages, than it is possible to realize over a surface so vast in proportion to either the present, or, we fear, future population within any short period.

In this great space Virginia comprises the central position, and in many respects the greatest concentration of natural advantages, and without any exception presents the most propitious natural field for immigrants that exists on the face of the earth. What is it, then, that keeps them at a distance, and drains your own people away from the graves of their parents and their own birth-places? The extreme cheapness of rich Government lands, generously surrendered by yourselves, (and a small portion of the proceeds of which you now so magnanimously reject,) and the facilities for rapid and cheap transportation to those lands, by works constructed by the enterprize and unaided resources of the people of New-York, act as resistless drains of immigrants to the West. But, except that her harbor is somewhat nearer and more accessible, what advantages has New-York enjoyed over Virginia, as to inherent resources, and in her relations to the West and South-West? and how has she contrived so to outstrip Virginia in public works, in education, in growth, and in power over the destinies of the Republic? Has she, let us repeat, more, or deeper, or farther reaching bays or rivers? or richer mines of coal and iron? or lime or marl? or more copious springs of salt water? or higher falls or greater volumes of water power? If New-York has the Hudson, with its head-spring near the Lakes, have not you the James river, extending yet nearer to the Kenawha, with its bosom *always open* to receive the products of your industry, while the Hudson is hermetrically sealed for months? Look along your eastern boundary, and from the margin of the Chesapeake, trace up to their sources all the noble rivers that rise in the heart of your agricultural population, like so many natural canals sweeping along thousands of miles of fertile shores, and compare all these with the comparatively narrow and iron bound shores of the Hudson! Where, then, let us repeat, is to be found the reason that you, the most favored portion of this continent except, perhaps, Maryland, stand still in mid growth, like a lightning blasted tree of the forest, while Northern States are going ahead in all that constitutes wealth and power, with a rapidity unparalleled in the annals of human population. Is it that these people *act* while you *talk?* At the instant that we are writing, a man, employed for nothing else but to distribute them, throws on the table within our reach, the following printed paper. Read it, we pray you—even *it* will serve to throw some light on the sort of people, and the progress with which you have to contend.

NOTICE TO EMIGRANTS.—The subscribers having been appointed Agents for forwarding Emigrants by Railroad from Albany to Buffalo and intermediate places, are enabled to send them, during the Summer, from New-York to Utica for $2,06; to Syracuse, $2,92; to Auburn, $3,36; to Rochester, $4,61; to Buffalo, $5,50. Children from 2 to 12 years old half price; under two years free; and all Baggage from Albany on the Railroad is entirely free.

It is evident that it comes much cheaper to the Emigrant to travel by railroad than by canal, he reaching Buffalo per steamboat from New-York, and railroad from Albany in 42 hours; whereas, it takes per canal from 9 to 10 days. The following calculation shows the result, viz:

Passage to Buffalo per Railroad	$5 50
Luggage from New-York to Albany, 100 lbs. free, balance for 100 lbs.	0 18
Luggage from Albany to Buffalo free.	
Living for 42 hours, say	0 75
Total per Railroad	$6 43
Passage to Buffalo per Canal, say	2 00
Luggage to Buffalo, 50 lbs. free, balance for 100 lbs.	0 55
Loss of time at least 9 days, worth to the laborer, say 50 cents per day	4 50
Living for 10 days, 50 cents per day	5 00
	$12 05
Deduct fare per Railroad	6 43
The traveler per Railroad saves	$5 62

They also forward passengers to Portsmouth, Cincinnati, and other places in Ohio, Pittsburgh, Louisville and St. Louis, at the lowest rates. All information as to different routes given *gratis*, and tickets to be had only at the Albany and Buffalo Railroad Office, 59 Cortlandt-street. WOLF & RICKERS.

Here, then, you behold, before a ship arrives at the wharf, as they are doing every day, with hundreds of immigrants, she is boarded and every passenger made to know that in forty-two hours he and his 100 pounds of baggage may be set down 450 *miles on his way to the West for* $6,43, including meals! while, suppose him to be at Washington, on his way to the West, it would cost him $2,50 to get along the first 38 miles, or *one-eleventh part* of the distance from New-York to Buffalo! It was not then, too soon, when, in forming your Society, in January

last, you called your Convention of "the first Statesmen of Virginia, the most distinguished Farmers of the State," together, as forcibly stated by Mr. Minor, "to engender a general and universal spirit of improvement, and to bring its influence to bear not only on the peculiar interests of the Farmers, but on all the great and vital interests of the Commonwealth." May the result be, in the words of the strong Address elicited on that occasion, "the correction of defective systems of husbandry, the introduction of improved breeds of cattle and of the best and cheapest implements of Agriculture, and the general diffusion of *valuable, interesting* and *profitable information*, where ignorance, indifference or obstinacy now retard the progress of improvement."

On looking back at what we have written, we find it will be necessary to postpone to the next number the reflections suggested by a view of the case as already set forth; and if we were sure that the able men who have taken it in hand would not *look back*, we would not dare suggest remedies in the présence of physicians so much more eminent and skillful. As it is, we shall continue in the next number of *The Farmers' Library* an exposition of such views as have occurred to us, but we shall do it with a stronger feeling of justification, and hope of escaping all charge of presumption, by throwing what we have to say in the form of a letter in reply to one just received from Mr. AFFLECK, an agriculturist of the first order of intelligence and public spirit, in Mississippi, who gives us the glad tidings that there, too, "*the first important step has been taken.*" In the meantime, we will only premise further, that we apprehend the remedies proposed do not go to the root of the disease—that they will prove palliatives rather than cures. It is not, as it seems to us, improved breeds of animals, or improved implements, that Virginia needs. The existence and the whereabouts of both of these are known, and he who has means can have no difficulty in procuring them. The disease lies much deeper. But we have already appropriated more space than we could have done with propriety, were it not, as before intimated, that whatever observations apply to the industrial resources of Virginia, are in a great measure applicable to all the grain growing States South and West of the Delaware.

Thus far had we written with a running pen, when the post-boy lays on our table a letter, from which we at once make an extract, illustrative of all we have said about the advantages which Virginia offers to immigrants. These lands are in a county already settled and eminently healthy, with every social comfort within reach and the means of independent living so abundant on the spot, as scarcely to leave an excuse to any reasonable man for any outlay except for tea and coffee. Sugar, it is presumed, may be extracted from the maple on the spot; and from personal observation many years ago, we can pronounce it no exaggeration to call it a land literally flowing in *milk and honey*. The letter is from a gentleman at Fredericksburg, of the highest respectability:

"FREDERICKSBURG, (Va.) June 18, 1845.

"*Dear Sir:* I own a very considerable quantity of land in the Western counties of Virginia, much selected with an eye to advantages that I thought the systems of internal improvements (slowly in progress in Virginia) would make desirable, as well for its locality as for its capacity to produce grain and grass. I have several small tracts united, making about 9,000 to 10,000 acres in the county of Fayette, about half way between Charleston, the county seat of Kanawha county, and Lewisburg, the county seat of Greenbrier county. The great improvement connecting the Ohio river and Richmond, Va., passes through this land by a turnpike. But another mode of improvement is contemplated, but whether it will be effected time will prove. I have about 10,000 acres in the county of Lewis, Va., through which the turnpike from Staunton to Parkersburg, on the Ohio, passes. These lands are very fertile and heavily timbered with oaks, poplar, beech, sugar-tree, elm and hickory.

"I should be glad to procure substantial occupants on these lands, and would give a *long credit*, with one-fourth part of the purchase money paid in hand—and for the residue, say from one to ten years time. This land will be in price, from *from one dollar and fifty cents to four dollars per acre.*

"I have other good lands, perhaps richer than the foregoing, in small detached tracts, from 150 to 1000 acres—rolling, rich land, finely watered and remarkably healthy."

The extract is made merely to show one of the thousand opportunities that exist for eligible settlement in the Old Dominion. But besides natural advantages, much depends, in such cases, on the *policy of the States that offer them!*

But below we give another letter, just at hand:

ON THE COMMON SCHOOL SYSTEM OF NEW-YORK.

WE lose no time in giving the following very obliging letter, from the enlightened and efficient Deputy Superintendent of the Common Schools of New-York. We entirely concur in his views as to the expediency and practicability of making these schools the blessed instruments of raising Agriculture to its just predominance in the list of intellectual pursuits. Nor do we at all despair of seeing such counsels as his ultimately pervading the whole region of country South of the Delaware, to which these remarks are more particularly directed.

Until opportunity offers for a fuller *resumé* of the valuable documents accompanying Mr. Randall's letter, we can only take room now to state,

in order to show the progress the system is making, that in 1815, the number of children in the State between the ages of *five* and *sixteen* years, residing in the School Districts, was 176,449, and the number then taught in said Districts was 140,106; while in 1843 the number in the Districts between those ages was 677,995, and the number *taught* was 657,782.—The aggregate amount of the funds applicable to the support of Common Schools and *District Libraries*, for the year ending 31st of December last, (*including revenue from U. S. Deposite fund!*) was—

Apportioned from the State	$275,000 00
Equal amount raised by Supervisors	275,000 00
Sums voluntarily raised by vote of towns	18,000 00
Sums raised in cities under special laws	200,000 00
Local funds	18,000 00
Total	$786,000 00

The great beauty of this exposition is, that all this is done by these Northern men cheerfully and punctually, under an organization embracing, in the words of Mr. Randall, "the entire territory of the State, and cemented together by the active and constant coöperation of our fellow-citizens generally, without distinction of party or sect."

SECRETARY'S OFFICE,
DEPARTMENT OF COMMON SCHOOLS,
Albany, June 23, 1845.

MR. J. S. SKINNER:

Dear Sir: I have the honor to transmit herewith, for your acceptance, a copy of the last Annual Report from this Department, together with a concise exposition and history of our Common School system, prepared by myself, and placed, under the directions of the Legislature, in each of our School District Libraries. An examination of these documents will enable you to obtain a good general idea of the prominent features of our system of public instruction, its capabilities and results.

It has occurred to me that an organization so extensive and efficient—embracing the entire territory of our State, and cemented together by the active and constant coöperation of our fellow-citizens generally, without distinction of party or sect—might afford a most valuable medium for the collection and diffusion of Agricultural Science. Emanating from the Principals and Professors of our State Normal School, this indispensable branch of modern education might, as it seems to me, find its way through the teachers there annually educated and sent forth, to the several County Associations of teachers, and by them be carried into each of the eleven thousand School Districts of our State, to fertilize, in good time, as well the soil as the mind. My views upon this subject have been given, somewhat at length, in two communications addressed to a Committee of the State Agricultural Society, of which Hon. John Greig was Chairman, in reply to a Circular received from the late Recording Secretary; and will be found in the volume of the Transactions of the Society for the present year, recently published. They have elicited considerable opposition from practical farmers as well as practical educationists, upon the ground not only that our elementary schools are not sufficiently advanced to admit of the introduction of Agricultural Science as a specific branch of study, but that Agricultural Science itself is still in its infancy, and therefore not entitled as yet to take rank with those standard branches which are required to be taught in our institutions of learning. These objections, it will readily be perceived, even if their validity be conceded to the fullest extent that can be claimed for them, are of a temporary character; and in propositions and discussions of this nature, I think we should regard the future even more than the present. Through the agencies now developing themselves in every section of the State, we may reasonably, in my judgment, indulge the hope that a few years will place our Common Schools on very high ground as nurseries of the mind and the heart; and will enable them to dispense broad-cast over our entire population, the seeds of sound knowledge and lasting improvement; nor, judging of the probable future from the past, need we labor under any apprehensions that the progress of Agricultural Science, in all its departments, will keep pace with the advancement of the age in other respects. With every disposition, therefore, to concede to the greater practical knowledge and more enlarged experience of those who view this subject differently, I cannot regard the suggestion that this important branch of a finished education should be introduced into our Common Schools as either visionary or impracticable. My own earnest conviction is that it should be so introduced: that every teacher should be capable of teaching its elementary principles; that text-books on the various subjects connected with these principles, adapted to the comprehension of the learner, should be prepared and used; and that well-written treatises and essays on these subjects should find a prominent place in every District Library. In this way, I am satisfied, great and lasting good may be accomplished: and I would respectfully invoke your earnest and efficient coöperation in the extension and enforcement of these views, should they be so fortunate as to meet with your approbation. Should a favorable opportunity present itself, in the course of your undertaking, it will afford me the utmost pleasure to discuss this whole subject, in a friendly and familiar spirit, with those who view it through a less enthusiastic certainly, and perhaps a more practical, medium than myself.

With great respect, your obedient servant,
SAMUEL S. RANDALL,
Deputy Superintendent Common Schools.

Nothing is more satisfactory than the demand for the means of DRAINING LAND, as evinced by the constant efforts which are making to provide tile-machines which shall manufacture them cheaply and well. We have to direct the attention of our readers to an advertisement in last week's number, which states that a machine capable of delivering 800 feet per hour of tiles 3¼ inches by 3½ is on exhibition at No. 14 South-street, Manchester-square, London, where any one interested in draining land may attend and judge of its efficacy. Messrs. B. Denton and Charnock, who are connected with it, are well known by their useful writings on the subject of drainage. [English paper.

New York Published by Gray & M. Elrath from Flowers Library

SILK PLANT FROM TRIPOLI.

For the Silk Plant, which has been lithographed for this number we are indebted to the Secretary of the National Institute, so called—we say so called, for although truly broad and National in spirit and objects, we are not aware that it has yet been adopted, by the wise men who guard the interests and character of the Republic, and who ought to be the first to see that its true welfare and glory can in no way be so well secured as by manifesting in the spirit of their laws a love of justice and a readiness to promote the permanent growth of the arts and sciences.

Even the fund so munificently bestowed by a stranger in a foreign land, in a moment of enthusiastic admiration of our government, to found an Institution at *Washington*, for the diffusion of useful knowledge, if not improvidently squandered, is at least withheld, as if to show to the world that we are wanting either in sense or honesty to appropriate it. How could that be better appropriated than by bestowing it on the National Institute, with a condition requiring the use of it for the promotion and diffusion of the Science of Agriculture, in something like the proportion that that interest bears to all others in the country.

The Meteorological Table which accompanied the drawing and description of the "Silk-Plant," was sent back to Secretary Markoe, so that we cannot institute an exact comparison between the climate of Tripoli and the Southern States, but we doubt not the plant would flourish in the South if conviction of its adaptation to practical purposes should invite its cultivation. But the wish to encourage the Institute, in making the *Farmers' Library* the depository of whatever may be deemed an useful addition to the stock of American Agricultural knowledge or products, is sufficient inducement to give place to any of its communications, in a manner best calculated to evince our sense of duty as a member of the Institute and our individual anxiety to see it achieve its laudable and exalted purposes.

We have a few seed for distribution.

The Plate of the plant, for convenience, has been reduced to very little more than half of its natural size.

U. S. Consulate,
Tripoli, 28th December, 1844.

To Francis Markoe, Jr. Esq.
Cor. Sec. of the National Institute, Washington.

Sir: I herewith transmit to the Institute a small specimen of "vegetable silk," raised from a few seed that I received from Lucca (Italy,) which originally came from Syria.

Without any instruction or knowledge of this plant, I sowed the seeds in pots in the month of March last. In May and June they obtained the heighth of six to eight inches, when I transplanted them into my garden, about eight inches apart, much too near as my experience proves. In the months of August and September they were in flower, and the pods commenced opening in October, the plants being from six to eight feet high, and though we have had the thermometer frequently as low as 42° Fahrenheit, and the apricot and pomegranate trees, with the vine, have all shed their leaves, yet there remain several pods, on the "Silk plant" which are still perfectly green and show no signs of suffering or cold. This, with some other proofs of the plant being hardy, induces me to believe and hope that it might be successfully cultivated in all our cotton growing States, and should it become a staple commodity, no doubt the inventive genius of our countrymen would soon discover the means of spinning it without the aid of the cotton fibre, which I am told they use in Syria to assist the spinning—their knowledge of the art not extending beyond the primitive distaff. The only information that I have acquired of this plant, further than recounted above, is from the mouth of one of the "propaganda" established here, who has seen it growing in Syria, where he tells me it flourishes, and that "the cultivation of a small field gives support to a family;" that in the second and third years it is extremely productive. The plants grow to the height of ten to fifteen feet, and are generally separated from eight to ten feet from each other.

I also forward you by this occasion the small quantity of seed of the plant which the limited number I have raised enables me to spare, with the hope of sending a greater quantity next year should the climate of our Southern States prove favorable to its culture, or should it be even otherwise interesting.

I beg you will distribute these seeds amongst those gentlemen from our "cotton growing States," who will take an interest in making an experiment of the cultivation. Permit me to mention two gentlemen to whom I would be pleased to have presented a small portion: Hon. Richard Donnel, of Newbern, N. C., and Hon. D. Levy, M. C., from Florida.

Fearing to trust to my botanical knowledge in giving a satisfactory description of the plant, I send a preserved specimen of a small branch of the plant, with the pods or cocoon attached, and also a rough sketch on paper of the same, which may serve in the event of the specimen itself not being properly preserved.

I also enclose a summary of Meterological observations, made here, for the year ending July 1, 1844, the details of which, I have regularly forwarded to the Surgeon General of the Army.

Very respectfully, Sir, your most ob't. serv't.

D. SMITH M'CAULEY.

Culture of Silk in South Carolina.

DAVIS'S MILLS, Barnwell District, S. C. May 1, 1845.

Sir: The prospects of Silk in this section of the country are poor indeed. The long warm spell through February and part of March, brought out vegetation rapidly—the Silk Worms hatched out early and were prosperous until the cold weather set in, destroying in many places the peaches and many other fruits, cutting down the corn many blades high, and killing much of it —entirely destroying much of the forward wheat—killing the Mulberry leaves of every description. Of course most of the Silk Worms were lost. I saved a few thousands by cutting the tender twigs, stripping off the bark and giving both the twig and bark for food. The drouth setting in about the fourth week in March, continued until last week, when we had a light shower. So vegetation has been kept back very much. This week we have fine refreshing showers, and all around seems to smile in beauty. The few cocoons made seem firm and of good quality. Very little disease has been among the Worms this season here. I think on average five to the thousand have not taken disease. I expect at some future time to state my method of raising them. I intend sending to the Institute what may remain after saving a supply of eggs, principally to convince the citizens that it is in their power to raise them to advantage, by aid of the old and young members of the family, who now raise hardly any thing. When once they see that something can be obtained for their labor, hundreds, I think, in this section of country, will readily come into raising Silk, to their own comfort, and the general benefit of their country.

Very respectfully, your ob't. serv't.
(Signed) NEEDHAM DAVIS.

Directed to the American Institute.

WOOLEN MANUFACTURES AND WOOL.—Returns upon this subject were issued on Saturday, by order of the House of Commons (on motions of Mr. Masterman and Mr. Aldam). It thence appears that the declared value of the British woolen manufactures exported from the United Kingdom in 1844 was £68,204,836, of which £2,444,789 worth was exported to the United States of America. During the same year 65,079,524 lbs. of sheep and lambs' wool, foreign and colonial, were imported into the United Kingdon, of which 1,924,826 lbs. were re-exported from the United Kingdom, chiefly to Belgium. Of British sheep and lambs' wool, 8,947,619 lbs. were exported to foreign countries; and 8,271,906 lbs. of British woolen and worsted yarn, including yarn of wool or worsted mixed with other materials. There were also imported into the United Kingdom 635,357 lbs. (of which 47,848 lbs. were re-exported) of alpaca and llama wool; and 1,290,771 lbs. of mohair, or goats' wool, of which 97,529 lbs. were re-exported. English paper.

AN EXTRAORDINARY PROLIFIC PIG.—Our respected townsman, Mr. Charles Minshull, of Highgate, has a sow which has produced him 61 pigs in one year, viz: on the 13th of May, 1844, 21; 5th of November, 18; 1st of May, 1845, 22;—total, 61. Of this valuable breed Mr. Minshull has brawn of the November *litter*. [Birmingham Advertiser.

WONDERFUL ENGINE.—It is alleged that a wonderful engine, called the air-engine, has lately been constructed by Professor Reinagle, who is securing patents in every civilized country of the earth. The power, which is self-produced in the engine, is obtained from condensed air, which, though easily manageable, begets an immense force, the present engine, which stands on a space not exceeding two feet square, having a power equal to five hundred and sixty-eight horses. For pumping water out of mines it is gravely proposed to use a 10,000 or 20,000 horse-power in order to do the work promptly, It is stated that, with the present small engine, two hundred and twenty tons can be propelled at the rate of twenty-five to thirty miles per hour. The description of the action of the machine is very vague, but it is said that several very eminent and scientific men have examined it and expressed their astonishment. Professor Faraday, having seen the drawing and heard the theory and practice of this invention explained, complimented the inventor by declaring, that he had discovered perpetual motion of the most terrific description.

NUTRITIOUS FOOD.—A very interesting report on the comparative nutritive properties of food was lately presented to the French Minister of the Interior by Messrs. Percy and Vanquelin, two members of the Institute. The result of their experiments is as follows: In bread, every hundred pounds' weight are found to contain 80 lbs. of nutritious matter; butcher meat, averaging the various sorts, contains only 31 lbs. in 100 lbs.; French beans, 25 lbs.; peas, 23 lbs.; lentiles, 94 lbs.; greens and turnips, which are the most aqueous of all vegetables used for domestic purposes, furnish only 8 lbs. of solid nutritious substance in 100 lbs.; carrots 14 lbs.; and what is very remarkable, as being in opposition to the acknowledged theory, 100 lbs. of potatoes only yield 35 lbs. of substance valuable as nutritious. According to this estimate, 1 lb. of good bread is equal to 2½ or 3 lbs. of best potatoes; and 75 lbs. of bread, and 30 lbs. of butcher meat are equal to 300 lbs. of potatoes. Or, again, 1 lb. of rice or of broad beans is equal to 3 lbs of potatoes; while 1 lb. of potatoes is equal to 4 lbs. of cabbage, and to 3 lbs. of turnips. This calculation is considered perfectly correct, and may be useful to families where the best mode of supporting nature should be adopted at the least expense.

[Chambers's Edinburgh Journal.

NEW GRAPE.—We have tasted a bottle of delicious Champagne Wine made from a vine which Mr. Lester, U. S. Consul at Genoa has just brought with him from Italy. A quantity of these vines was sold, by Wm. H. Franklin & Son, 15 Broad street, on 1st of July. We are informed that these vines were taken from Savoy and Piedmont, *from under the snow*, and consequently will endure the cold winters of our climate, and we believe they are the first Italian vines ever introduced into the U. States, which could be cultivated in the open field. The wine is the richest and most delicious Champagne we have ever drank. We are informed by American gentlemen who have eaten the grape at Mr. Lester's house at Genoa that they found none so delicious in any other part of Europe. We understand there are several varieties. [Evening Mirror.

A NEW VEGETABLE AND NEW GRASSES:

RECOMMENDED TO BE IMPORTED.

It is the crowning glory of Commerce that her office is to maintain throughout the world an equilibrium of knowledge, to transfer whatever is peculiar and valuable in one climate or country, to be cultivated and enjoyed in every other, where Nature can be persuaded by Art to entertain and support it; or where this may not be done profitably, then it is her province to interchange whatever might bear transportation, but refuses to be acclimated. Thus has Commerce been justly denominated the handmaid of civilization—and who so barbarous as not to do her homage in that beautiful character?

Viewed in this light, it is easy to see how the Merchant may become the benefactor of the Farmer when appealed to in his behalf, to introduce from abroad new vegetables, plants, animals, machines and materials for the promotion of American Husbandry. Now, for example, if our brief residence did not forbid it, we would call upon some generous New-York Merchant-Farmer or friend of Farmers, of whom doubtless there are many, to import a new *Grass*, much spoken of in late English papers, that no time might be lost in securing the benefit of it, if adapted to our climate. And here it is worthy of remark, that while in manufacturing and other arts the delay of a few weeks in the importation of any new contrivance or discovery involves the loss of only that much time, it is far different with Agriculture and Horticulture. The delay of a week or two may involve the loss of a season, and with it the entire year. We have ourselves had occasion to feel the force of this, in the commencing number of the Farmers' Library; for while we have on hand a mass of matter which seems calculated to throw much light on the preparation of the land and other points connected with the culture of *Turnips* and *Potatoes*, two most important products of Agriculture, we have entered upon our duties just a few weeks too late to present any thing now available on *these subjects*. We must therefore reserve for a more appropriate opportunity much of what we hope may prove useful if not new on these points. But as to the Grass that has lately been mentioned with strong commendation and interest, in the English journals, and which we hope to see imported by some gentlemen having facilities to do it.

We find the following notice in the January number of "The Journal of Agriculture and Transactions of the Highland Agricultural Society of Scotland." Who knows but that before many years we may see all the marshes along the sea-beach, from Marshfield to the sea-shores of North Carolina, green with luxuriant crops of the Tussac and Tescue Grasses?

TUSSAC GRASS OF THE FALKLAND ISLANDS.

BY REV. JAMES DUNCAN, M. W. S.

So much has of late been said respecting this grass, and such high expectations have been formed of it proving a valuable acquisition if introduced and propagated in this country, that a brief description of its appearance and properties can scarcely fail, we think, to be acceptable to the readers of this journal. Although not brought prominently into notice till the recent voyage of discovery in the antarctic regions, under the superintendence of Captain Ross, it has been long known to botanists, and is alluded to by most of the navigators who have touched at the islands which form its principal locality since the days of Cook. Its botanical characters, however, do not seem to have been closely examined, nor rightly understood, until investigated by Sir W. J. Hooker, who has given an account of it, accompanied with a colored representation, in a pamphlet entitled "Notes on the Botany of the Antarctic Voyage." Neither does it seem to have occurred to those who first noticed this grass that it was calculated to flourish on the shores of northern Europe, the circumstance which now claims for it such a degree of attention.

It is called the Tussac grass from its habit of growth, the roots becoming densely matted together, and the lower parts of the stalks forming a large tuft or *tussac*. These basal or columnar portions, formed by the close approximation of the stems or culms, often rise to a considerable height—from four to six feet; the long tapering leaves then diverge from them, and hang down all around, often in a very graceful curve, like the falling waters of a *jet d'eau*. These masses are insulated, generally a few feet apart, and the leaves, meeting above, form a kind of arched roof, beneath which the ground is generally quite bare of vegetation. A *tussac ground* thus forms a complete labyrinth, and a man may walk among its green arcades completely concealed from view. Nay, a house may be formed of it in a very short time: the inclined stems, when fastened together, may be made to serve as a roof, while the dry leaves about the root make a tolerably good bed. Bougainville states that he often in this way obtained shelter for himself during his wanderings. This, however, refers to the plant in its most luxuriant state of growth: it is often so low as scarcely to afford adequate shelter to the flocks of penguins which resort to it for the purpose of building their nests and rearing their young.

By the earlier naturalists who examined this

grass, it was thought to be a fescue, and we accordingly have it referred to under the names of *Festuca flabellata* and *Festuca cæspitosa*. Forster notices under the name of *Dactylis cæspitosa*, and that appellation is now retained, as a careful examination of its character leaves no doubt that it belongs to the genus *Dactylis*. It has thus a generic relationship to a well-known grass in this country, the *Dactylis glomerata*, or cock's foot—[or orchard grass]—a strong, coarse grass, insulated tufts of which may be seen growing by the side of every hedgerow and field. The tussac is perennial; the root consists of a dense mass of tortuous fibres. The stems, which spring from the little hillock formed by the roots, are numerous, erect, branched or divided only at the base, from three to four feet long, smooth, and compressed. The leaves are numerous, the lower ones very long, not unfrequently from five to seven feet, about an inch broad at the base, and gradually tapering to a point; from above the middle they are curved downwards, or even pendent; the stem-leaves become gradually shorter upwards, and are of a pale glaucous or sea-green color; the other leaves are pale yellow. The panicle is a span long or upwards, very dense, forming a somewhat interrupted spike, nearly two inches broad, compressed and obtuse; the branches short and erect; the rachis angled. "Spikelet composed of three or four florets, of a pale yellow-green color. The calycine glumes are lanceolate, acuminate, longer than the spike of flowers, slightly keeled, shortly ciliated on the back, three and a-half lines long, the margins a little involute, and, as well as the apex, membranous and transparent, the superior one a little longer than the other, three-nerved, the nerves ciliated. The lower glume or palea of the corolla is ovate, concave, compressed, and sharply keeled; bluntly trifid at the apex, five-nerved. Stamens three. Anthers pale yellow. Ovary nearly ovate and glabrous. Fruit elongate-ovate, or almost cylindrical, slightly trigonous, of a pale yellow color, and smooth."*

It will at once appear, from the length and breadth of the leaves, the dimensions of the culms, and the profusion in which both these are produced, what an immense quantity of herbage this plant is calculated to afford. Both the leaves and stems abound in saccharine matter, and form a most nutritious food. The inner portion of the stem, for a little way above the root, is soft, crisp, well-flavored, somewhat resembling the kernel of a nut, and is often eaten by the inhabitants of the Falkland islands. The young shoots also are boiled and eaten like asparagus. This tends to show the wholesome nature of the whole plant as an esculent; but it is as affording pasturage for cattle that the tussac is to be chiefly valued. The Falkland islands have long been known to be inhabited by many wild cattle and troops of horses, and these are principally supported by this grass, which they prefer to every other kind of food. Not only these, but every herbivorous animal in these regions not only devours the tussac with avidity, but is affirmed to fatten on it in a short time. This predilection is shown for it both in a green state and when dried, insomuch that cows and horses often eat the thatch from the roofs of the houses when it happens, as it often does, to be composed of tussac grass.

* Hooker. "Notes on the Botany of the Antarctic Voyage," p. 50.

"During several long rides," says Lieut. R. C. Moody, "into the country, I have always found the tussac flourishing most vigorously in spots exposed to the sea, and on soil unfit for any other plant, viz. the rankest peat-bog, black or red. It is singular to observe the beaten foot-paths of the wild cattle and horses, marked like a foot-track across fields in England; extending for miles over barren moor-land, and always terminating in some point or peninsula covered with this favorite fodder; amid which one is almost certain to meet with solitary old bulls, or, perhaps, a herd of cattle—very likely a troop of wild horses, just trotting off as they scent the coming stranger from afar. I have not tried how it would be relished if made into hay, but cattle will eat the dry thatch off the roof of a house in Winter; their preference to tussac grass being so great that they scent it a considerable distance, and use every effort to get at it. Some bundles, which had been stacked in the yard at the back of Government House, were quickly detected, and the cattle from the village made, every night, repeated attempts to reach them, which occasioned great trouble to the sentry upon duty." It is the opinion of those who have visited the Falkland islands, that, if proper attention were paid to the propagation of the tussac grass, and if it were prevented from being entirely eaten down in those places where it now abounds, it would, of itself, without aid from the other indigenous vegetation, not only yield abundant pasturage to all the cattle now existing there, but would support as many as there is ever likely to be a demand for in that quarter of the globe.

The islands just mentioned may be said to form the metropolis of this interesting plant, and, as far as yet known, its geographical range is comprehended within the 50° and 60° S. latitude. Forster found it in New-Year's Island, Staten Land. Commerson cites the Straits of Magelhaens as one of its localities; and Dr. Hooker saw it on Hermite Island, Cape Horn. It has also been noticed in considerable quantity in some of the smaller of the Aukland group of islands.

It is generally found growing near the shore, and flourishes best where the saline spray dashes over it. Indeed, exposure to the sea-breeze, and the peculiar influences which emanate from the ocean, are conditions which seem essential to its prosperity. It is then only that it reaches its most stately proportions, and assumes that exuberant and imposing form, which have led one author to speak of it as the "splendid tussac grass, the gold and glory of the Falklands."—As it recedes from the ocean, it becomes dwarfed and sickly, as if out of its kindred and appropriate element, in this respect resembling our own native *Arundo arenaria*, *Triticum junceum*, and certain other gramineous plants. As with these also, and a considerable number of other species, the glaucous color of the tussac grass may be regarded as indicating it to be a littoral plant; for it would seem as if many of the plants growing near the sea caught their hues, as they are known to acquire certain other of their properties, from the element in their vicinity. It is probable that the saline matter the plant derives from the spray and sea-breezes, contributes not a little to render it so palatable to cattle. The ground on which the tussac grass flourishes best is a wet peaty soil, often very bleak and poor, and scarcely capable of sustaining any other kind of herbage.

It seems to be the almost unanimous opinion of those who have examined this plant in its native localities, that it would succeed in certain situations in our own country. A writer in the "Guernsey Star" newspaper, who appears familiar with the subject, expresses his hope that the "splendid tussac grass will yet make the fortune of Orkney and the owners of Irish peat-bogs." The Governor of the Falkland Islands, Lieutenant R. C. Moody, is of opinion that "the wild West Coast of Ireland would exactly suit this grass." Mr. Lyall, of the discovery ship "*Terror*,"—than whom no one has more zealously investigated the botany of these regions—in a communication to the writer of this notice, says: "I should think that sheltered spots, near the beach, on some of the smaller of our Western islands, are the situations in which the tussac grass is most likely to succeed." Sir W. J. Hooker says: "The nature of the soil and climate producing this grass gives every reason to believe that the shores of a vast extent of England, Scotland and Ireland would suit it equally well; more especially the Western coasts of the two latter countries."

In these circumstances, public curiosity could scarcely fail to be excited, and some degree of interest to be attached to the attempts made to introduce the grass into Britain. No living plants ever reached this country. Dr. Hooker did, indeed, dispatch some young plants in cases, but they perished during the voyage. The seeds have been found to germinate freely in the Governor's garden in the Falkland Islands, and it was thought there was every probability that they would likewise do so when transported to this country. The first attempt to rear the plant from seed in Britain was made by Sir W. J. Hooker, in Kew Gardens, but he entirely failed. Last Winter, a package of seed, carefully collected and preserved by himself, was presented to the writer of this notice by Mr. Lyall, of the "*Terror*." It was duly sown last April in a garden in the village of Denholm, Roxburghshire, and carefully attended to; but although the seeds seemed healthy, and in good condition, not one germinated. Seeds collected at the same time, and by the same individual, were sown in Kew Gardens, but the result was the same. The Highland and Agricultural Society of Scotland lately purchased two lbs. of seed, which had been sent to the Colonial Office. It has been intrusted to the care of Mr. Lawson, the society's seedsman, and, if it fail to grow, it will be from no want of attention or skillful treatment. It was lately stated in the newspapers that Dr. Murray, of Hull, had succeeded in raising several plants from seed given to him by Sir W. J. Hooker, and his success was ascribed to his having steeped the seed in some chemical solution previous to sowing it.

It is not easy to see any reason why the Tussac Grass should not succeed, at least to a certain extent, in this country. The climate, soil, and most other conditions, are not so different from those it meets with in its native regions as to be likely to form insuperable obstacles. It should be remembered, also, that the grasses in general have a very wide geographical range; some of them, in fact, such as the *Poa annua*, perhaps approach nearer to true cosmopolites than any other distinctly flowering plants. The high utility of this tribe of plants in affording food to animals, might lead us beforehand to imagine that they would be widely distributed, readily propagated, and possess the power of accommodating themselves with facility to a change of circumstances. This we accordingly find to be the case in a singular degree, and it affords a fair presumption of success in any attempt to bring a grass from one country for the purpose of being cultivated in another. In the present instance, one of the circumstances which indicates most strikingly that the influences under which the Tussac flourishes in a Southern latitude are not remarkably different from those to which it would be subjected in a Northern one, is the fact that, on the very same grounds where it prospers is to be found a variety of plants which also grow naturally in Britain.—Among these are the common grasses, *Lolium perenne*, *Aira flexuosa*, and a species of *Triticum*, probably *T. junceum*. If these grasses thrive in the Falkland Islands under the same conditions as the Tussac, it may be fairly inferred that the latter would not refuse to grow in Britain, where they find all that is necessary for their prosperity. Among the other British plants growing in the Falkland Islands may be mentioned *Apium graveolens*, *Cerastium vulgatum*, *Alsine media*, *Senecio vulgaris*, *Veronica serpyllifolia*, and *Rumex acetosella*. In fact, the general aspect of the vegetation is essentially European, and in not a few respects resembles that of Great Britain. We shall probably, however, be disappointed if we expect the Tussac to reach its utmost state of luxuriance in this country, and to form those huge and almost arborescent masses of herbage, an assemblage of which resembles a thick-set copsewood, or a miniature forest; but even in a dwarfed and imperfect condition, it could not fail to be an important addition to our native grasses, and would still greatly exceed the dimensions even of the most stately of them.

When cultivated in the Falkland Islands, it is recommended either that the seed should be sown in patches, just below the surface of the earth, and at distances of about two feet apart, or that it should be drilled in rows, like turnips. Treated in the latter way, it was found to spring up strongly from the seed. It must, however, be taken into consideration, as remarked by Sir W. J. Hooker, that, in order that it may thrive in this country, the plant must so far change its habits of the Southern hemisphere as to forget that our Winter is its Summer, and *vice versa*.

The merits of the above grass have probably been the cause of another similar production of the Falkland Islands having been in a great measure overlooked, although its qualities seem to be such as to entitle it to attention. This is a kind of fescue grass, the *Festuca alopecurus* of D'Urville, and the *Arundo alopecurus* of Gaudichaud. In a report transmitted to Lord Stanley, it is spoken of in the following terms:

"Another, grass, however, and of more extensive distribution than the Tussac, scarcely yields to it in nutritious qualities. It covers every peat-bog with a dense and rich clothing of green in Summer, and a pale-yellow good hay during the Winter season. This, hay, though formed by nature without the operation of mowing and drying, keeps those cattle which have not access to the Tussac in excellent condition, as was proved by the beef with which our hunting parties supplied, for four months, the discovery ships. No bog, however rank, seems too bad for this plant to luxriate upon, and, as was observed during a surveying excursion which had been made to Port William, although

the soil on the quartz districts was very unprolific in many good grasses which flourish on the slate-clay, and was, generally speaking, of the worst description, still this fescue-grass did not appear to be affected by the difference, nor did the cattle fail to eat down large tracts of such pasturage.

"The numerous troops of horses, too, on the flanks of the Wickham heights, can procure little other fodder; while those of Mount Lowe and Mount Vernet must depend upon it entirely. Should the Tussac disappear from any part of the Falklands, where stall-fed cattle are kept, it might be desirable to treat this fescue-grass as hay in England; by which process its nutritious qualities would, doubtless, be much better secured to the animals during winter than by suffering the leaves gradually to wither, and not gathering them till nature has evaporated all the juices. For sheep it might also answer well, when converted into hay, though it seems likely that the wet nature of this grass, together with the damp situation where it grows, would prevent these creatures thriving upon it, if restricted to such diet; and, at all events, newly imported flocks should not be suddenly removed from dry food to what is of so very succulent a nature."

KOHL RABI—IMPORTANT TO FARMERS.

Sir: Everything which in the slightest degree tends to the improvement of Agriculture is, in the present day, of so much importance that I need not apologize to you for troubling you with a few lines on a subject so interesting to the cultivators of the soil. The deficiency of the Turnip and Swede crop, in consequence of the extraordinary drouth of the last Summer, and the innumerable destructive insects, fly, grub, &c., produced by the dry and warm weather, has been a lamentable blow to the farmers of this country, and should lead agriculturists to endeavor either to eradicate those enemies to their hopes, or to introduce a root equally valuable with the turnip while it is less obnoxious to the attacks of those vermin. The Kohl Rabi appears likely to supply this desideratum; and I wish, by giving you an account of my experience of it, to induce the farmers of this country to try it on a larger scale. If we can obtain a root (if I may use the Irishism of calling that a root which grows above ground) producing an amount of food—1st, equal in bulk to the largest crop of Swedish turnips; 2d, of equal or more nutritive qualities; 3d, not obnoxious to the attacks of grub or fly; 4th, better adapted for keeping through the Winter; 5th, capable of being planted at any season of the year; 6th, enduring the frost of our Winter—we shall have obtained one of the most useful and valuable plants which the Giver of all good has bestowed upon men. I may be considered too sanguine if I attribute all these qualities to the Kohl Rabi, but I feel convinced that it deserves the greatest part if not all the praise which I ascribe to it. I obtained a small quantity of seed in Germany last year, and in the month of March I sowed (thickly) a patch in a sunny bed in my kitchen garden; the plants soon came up as thickly as possible, much resembling young broccoli plants. The dry weather set in, and I despaired of being able to plant them out in the ground which I had prepared for them. After waiting several weeks, and fearing that the plants had become almost too old to transplant, I ventured to do so, lest the season should go by. I made a good, strong compost with cow-dung and water from a muddy pond, and another sort of diluted pigs' urine, and in planting each plant (about eighteen inches apart) I made a good puddle about the roots; in less than a week the plants held up their heads and began to grow vigorously. In October I gathered in my crop, and the result is as follows:—On a plot of ground, as nearly as I can reckon, containing 18 perches or lug, I had 27 kipe baskets full, weighing on the average 80 lbs. each, or, deducting 5 lbs. for the basket, 75 lbs. each; thus I had 2,025 lbs. on this small piece of ground, besides four or five hundred weight of mangel-wurzel and self-set potatoes. This, however, was the produce of the driest season in the memory of man. I have no doubt that more than double the amount might be expected in any other season. Several of the bulbs weighed six or seven pounds. I purpose sending a few as specimens to the Gloucestershire Agricultural Show. I sowed some more seed on chance, without any manure, in a soil rather impoverished, in the month of June, having waited in vain for rain. The plants came up but did not thrive. During the last month, after I had dug a field of potatoes in a good soil, I transferred these sickly plants to the late potato patch, where they have taken root, and are growing surprisingly: I purpose letting them stand the Winter, and have little doubt that they will endure the frost and snow.

Any agriculturist who would like to see them growing, and will apply to my bailiff, at Hempsted, is perfectly welcome to inspect the growing crop. The bulb partakes of a mixed character, something between the inside of a cabbage stock and a Swedish turnip. When young they are an excellent and delicious table vegetable. I am, Sir, yours obediently

SAMUEL LYSONS.

Hempsted Court, near Gloucester, Nov. 11.

N. B.—The seed should always be sown in a bed, and transplanted; it grows more rapidly, and would secure it from the attack of the fly, if it were inclined to attack it, which I believe it never is. [Gloucestershire Chronicle.

KOHL RABI, OR EGYPTIAN KALE.

To the Editor of the Farmers' Gazette:

Sir: In your paper of March 29th, there is a letter from Mr. Samuel Lysons, on the cultivation of the Kohl Rabi for cattle; and as Mr. L. mentions having obtained a small quantity of seed in Germany, it may not be generally known that it can be obtained from any respectable nursery man in this country. I have grown it annually (with the exception of two or three years) for the last eighteen years, as a culinary vegetable, and have found it very convenient and useful when other more tender vegetables were scarce, especially from October to May, during which time it can be had good. The tops are used, when young and tender, for greens; but these should be gathered very sparingly, otherwise it will retard the growth of the bulb, which sometimes, on strong, rich soils, will weigh a stone each; but when they come to anything like that size they are not fit for the table, as they get hard and woody; therefore, to have them tender and fit for the table for seven or eight months of the year, it is necessary to make two or three sowings from the first of March to the end of May, in a small seed bed, for which one ounce of seed will be sufficient;

and when the young plants have produced a few rough leaves, they should be pricked into a nursery-bed, six inches a part, and in four or five weeks they will be fine, strong plants to plant out finally in lines, two feet apart, and 14 or 15 inches in the line, as they, as well as almost every other sort of vegetable, are better flavored when allowed plenty of room for sun and air about them.

Those who may wish to cultivate Kohl Rabi on a large scale for cattle, must make their seed-bed accordingly; and, perhaps the last week in March, or beginning of April, would be the best time for sowing the seed; and as those would have but little chance of being pricked out into a nursery-bed, if the weather was favorable at the time of planting, they would do very well without it. Indeed, I have no doubt but they would do equally as well to sow at once in the drills, the same way as turnips, about the beginning of May. This would save a deal of labor, and not be so dependent on the weather; and as the seed is rather dear, it would be a more economical plan to dibble in the seed, at a foot apart, dropping two or three seeds into each hole along the top of the drills; and when the plants were of proper size to thin them out to one in each hole, and otherwise hoe and clean the ground, the same as for turnip crops; and when the bulbs get about the size of a person's hand, if a little earth is drawn to the stem it will do them good, but not to raise the earth so high as to cover any part of the bulb; and as they will stand very severe frosts without injury, I did not find it necessary to store them up in the Autumn. I think, Mr. Editor, that the cottagers would be greatly benefitted by growing annually more or less, as they had convenience, of Kohl Rabi, as it is a very hardy plant, and can be very readily cultivated; and, by having a small quantity sown in a seed-bed in the beginning of April, it would be ready to plant out in any spare corner, or after a crop of early potatoes. It is also well adapted to plant in any vacancies that may occur in late crops of field potatoes, &c., and with very little trouble it might produce a great deal of food; for, when boiled and sliced with a little melted butter, it makes a very palatable dish; and to those who have a cow or pig it would be particularly useful during Winter. Yours, &c.

JAMES ALEXANDER.

Heath Farm, Athy, April 1.

KOHL RABI.

I observed in the *Gardeners' Chronicle*, of the 8th inst., some account of growing Kohl Rabi in Gloucestershire. I wish to add my testimony of its hardihood and usefulness for field culture. Being very little affected by the insect tribe, of late so destructive to the turnip, its early growth is very rapid; the plants soon get out of the way of its only enemy, the slug. My method of cultivation is to drill 1 lb. per acre of the seed with the mangel-wurzel; so that if the mangel-wurzel fail, which it mostly does to some extent, I have plants enough of the Kohl Rabi in the field to fill all vacancies which occur on the ridge. This transplanting is done by women and children gowing up and down the furrows, and inserting a plant where it is wanted; and as they take up some earth with the root, the plant receives but little check in the operation. My Kohl Rabi has been exposed to the frost all the Winter without receiving injury; and when cut, affords excellent food for ewes and lambs. I do not find they get sticky except the stalk, which, when cut, cattle will eat down to the root with less waste and spoil than either mangel-wurzel or turnip.

J. S. in the Gloucester Telegraph.

P. S.—I have grown both the purple and green varieties; the purple always grows to the largest size.

SULPHATE OF LIME OR GYPSUM.—This substance, which is a compound of sulphuric acid and lime, is found in abundant quantities in a native state, both for the purpose of agriculture and the arts; and it has been recommended for the same purpose as the muriate of lime, viz: the fixing ammonia; but it is infinitely inferior for that purpose, in consequence of its difficult solubility—at the temperature of 60°, one part of gypsum only being soluble in 460 parts of water, to obtain which, however, the gypsum must be finely divided and macerated for a great length of time. Its more obvious use in agriculture is, however, as a direct food to certain plants, either as supplying the sulphate of lime or, by its decomposition, affording the sulphur necessary to the due development of certain plants, such as the Cruciferæ, &c. The following table, extracted from "Sprengel's Analyses," shows the quantity of lime and magnesia, sulphuric and phosphoric acids, in 100,000 parts in several of our ordinary crops:

	Lime	Magn'a.	Sulph. Acid.	Phos. Acid.
Wheat	96	69	50	406
Barley	106	180	59	210
Oats	86	67	35	70
Potatoes	33	32	54	40
Cabbage	1822	202	774	436
Swedish Turnips	835	282	890	408
Wheat Straw	240	32	37	170
Barley do.	554	76	118	160
Oat do.	152	22	79	12
Red Clover	584	70	94	138
Beet	285	133	123	167
Turnips	127	22	41	73

The above table may not be strictly accurate, but I believe it approximates to the truth, and certainly agrees with my own practical observations respecting the exhausting powers of different crops on various soils. Cabbages are known to be one of the most scourging crops that is grown, and we see from the above table that both it and swedes require a large amount of the sulphate of lime; the next is red clover, and the application of gypsum to the clover crop, on lands sparingly endowed with this substance, has been so repeatedly treated of, that it is an act of supererogation to enlarge on its usefulness.—[Jour. of Highland and Ag. Soc. of Scotland.

RHUBARB OR PIE PLANT.—This is another highly esteemed esculent for early Spring use, and of the easiest possible culture. The plants continue many years in full bearing, and occupy very little room—a small number being sufficient for a family. The seeds may be sown any time in Spring, and will make good strong plants in one year; when they should be transplanted to a rich deep border, or any convenient spot—placing them three or four feet apart. The stocks should not be cut until the plants are at least two years old. [Ohio Cultivator.

AGRICULTURAL MACHINES PATENTED.

By the aid of Mr. Keller, a scientific gentleman, lately of the Patent Office, and now agent for obtaining patents, and one in whom the utmost confidence may be placed, it will be in our power to keep our readers advised of the progress of improvement in Agricultural Machinery, as far as that progress may be indicated by the issuing of Patents for new inventions. It is not designed to cumber our pages with descriptions of every piece of humbuggery, however specious its pretensions, but the intention is, by engravings and descriptive explanations, to give the earliest and most authentic knowledge of whatever may come into existence which gives fair promise of saving labor and of augmenting crops. At present we must be content with presenting the last report to the Commissioner of Patents, made by Doct. Page, then, and we hope now, of the Patent Office. These (Keller and Page) are gentlemen, like many others, in the Departments at Washington, of sound scientific acquirements, who are little known to the public, but who are the real doers of the work, while their nominal and official superiors, too often sciolists and empirics, run away with all the credit. We are promised a summary which shall bring up the account to the middle of July—for the August number of the Farmers' Library.

"The large number of patents granted for applications pertaining to this class may be taken as fair ground for the deduction that the subject is still one of great growing interest, and is at present engrossing a very large share of the inventive talent of our country. In the short space of one year, it could hardly be expected that any important revolution, any signal discovery, or many really useful inventions, should be made in a pursuit claiming, above all others, the right of primogeniture. Advances, nevertheless, are constantly being made in this branch of industry. Every year it is acquiring fresh laurels and a higher reputation for itself. The "sweat of the brow" is not now the mainspring of its operations, the grand key to its success; nor the open field the sole theatre of experiment. The closet, the laboratory of the chemist, are its nurses. The most exalted intellects are becoming farmers, as it were, in the retiracy of their studies. Science, both chemical and physical, have become the palladium of agriculture.

Since the publication of Liebig's valuable work on the Chemistry of Agriculture, we must date a new era in this science. It has, at least, received a fresh impulse from his labors; and its publication in this country, in newspaper form, for the low price of 25 cents, (when the ordinary bookstore price has been $1 50,) will aid greatly in disseminating knowledge, so essential to farming interests. The use of guano as a manure has long been known in remote parts of the world, and this substance has been employed for many years to fertilize the barren soils on the coast of Peru; but it does not seem to have elicited attention, other than as a matter of curiosity, from the most enlightened agricultural portions of the world, until after the appearance of Liebig's work. The announcement that it was only necessary to add a small quantity of guano to a soil which consists of nothing but sand and clay, to procure the richest crop of maize, was sufficient to awaken an interest in the farmer, and excite the cupidity of the merchant. No writer has dwelt so much on the importance of nitrogen as a manure, as Liebig; and it is this feature in part, which constitutes the grand novelty and value of his work. In the above-quoted assertion, where Guano is added to clay and sand, we suppose not a trace of organic matter in the soil; and yet, by the addition of a manure, consisting chiefly of urate, phosphate, carbonate, and oxalate of ammonia salts, all containing nitrogen, we have the richest crops of maize. The husbanding substances containing nitrogen, and attention to the proper methods for its fixation, will soon become objects of paramount importance with the farmer.

Plows.—Several important improvements have been made in this instrument during the past year; but they are chiefly for modes of fastening and so fitting the points and shares, that, in case of wear or injury, they can be easily replaced by the farmer himself. It is a question, perhaps, yet to be decided, whether cast iron plows are more economical to the farmer than the plows with cast iron mould boards and wrought shares and points. In the latter, the mould board is liable to be broken, and, if so, can hardly be replaced; but, as the share and point are the parts most liable to injury, if these are wrought iron, and fastened in a simple and firm manner, the farmer who is in the neighborhood of an ordinary blacksmith, or may have one upon his establishment, can easily repair the damage, which, in the case of the cast iron plow, he could not do without sending to the manufacturer or the foundry for a new casting. This objection to the cast iron plow is now, in a great measure, obviated by many dealers, who are in the practice of putting up with each plow, for a slight extra expense, two or more extra points and shares. Few plows have been patented during the past year. Several applications have been made for patents for the substitution of steel for cast or wrought iron in plows, and rejected upon the well-established ground that the mere substitution of one well-known material for another is not the subject of a patent. Several cultivators and combined plows for light soils have been patented; but nothing of definite value can be predicated upon this class of inventions. An ingenious instrument for digging potatoes has been the subject of a patent, and, though it may fail to do all it professes, is certainly an approximation to an invention very much needed. This operation is

one of vast labor; and a cheap labor-saving machine, which, in case of very large crops, should leave one-tenth, or even a larger proportion of the crop in the ground, would be a welcome invention.

A promising improvement has been made in the grain cradle, by making the teeth of hollow metal, filling them up with wood sufficiently far to insure strength. The teeth glide very easily through the grain, and are not liable to the objection of warping and sticking where the grain is wet, as in the case with wooden teeth.

A simple and effective instrument for gathering fruit from trees has been patented, by which the ladder may be generally dispensed with, and the trees and fruit saved from injury.

Some important improvements have been made in smut machines, and in machines for hulling seeds.

The wheat fan, or winnowing machine, has been of late much improved by the use of the spiral fan in the place of the old flutter-wheel fan; and, although the introduction of the spiral fan is not recent, yet it has, during the past year, been introduced under such modifications as to render the instrument very serviceable. In connexion with this instrument also, an interesting and useful feature has been secured by patent, consisting of a mode of so operating the screens or sieves as to give just that motion which is imparted them when they are used in the hand.

Bee-hives.—A growing interest is evident in this branch of agriculture, and a large number of applications have been received. Seven of them have been patented, and a greater number rejected. Most of the alleged improvements have claimed to be remedies against the bee moth, the pest of the apiarian. As bee culture increases, the bee moth seems to become more numerous and troublesome, and should, therefore be vigorously met by vigilance and ingenuity. In this latitude, it requires every attention to save the bees from this their great enemy; and so formidable has it become from numbers, that the same devices which may, perhaps, be found to give protection further North, will not apply here.

Nothing yet seems to be of any value, except placing the hives upon the ground—the hives being made very tight, and the entrance of the bees being as low as possible.

EFFECTS OF ELECTRICITY ON VEGETATION.

We might be charged with indifference to the progress of Scientific Agriculture, were we to send out the first number of the Farmers' Library without adverting to one of the most remarkable novelties that has lately attracted public notice, to wit: The effects of experiments lately made in England to test the effects of Electricity on Vegetation. Hence we had arranged for publication what seemed most impressive and worthy of regard. On reflection, however, we conclude to postpone for another number all notice, except what follows. In the mean time we may observe that the subject seems to be, practically speaking, exactly in that state of uncertainty which demands further and more exact experiments, before it can be had recourse to by practical men with any certainty of useful results; and again, it will probably be found that in our own country, and by a member of our "Agricultural Association," too, the investigation and knowledge of this extraordinary agency, as connected with vegetation, has not been in the real of the fullest and most recent European expositions.

The paper in our collection, from English journals, the most cautious and candid and worthy of regard, (and it is highly so,) is the sketch which one of these journals contains, of a recent Lecture by Rev. E. Sydney, delivered before the Royal Institution of London—(one before which every man who does speak, must be on his guard)—and it happens to be within our knowledge, as it may be in our power to show, that *his* views had been, for the most part, by some weeks anticipated, to the effect we have already intimated. Finally, we may venture to promise by the aid of a friend, to keep our readers acquainted with what may transpire, as far as any useful purpose is to be accomplished, or the novel or lately revived subject of *Electro-Vegetation.* Without his aid, in the midst of such elements, we are free to confess it, we should feel in some danger of being drowned or *blown up.*

For an early and very interesting paper on this subject, the reader is referred to the April number of the American Agriculturist, from the pen of Mr. Norton, a most valuable contributor to that very enlightened journal. In that paper occurs the following passage:

"It was at first expected that manure would be of no further use, but it is now said that its action will be much more powerful with the help of this new ally."

On that passage the following remarks were made by the gentleman (Mr. Seely) member of the Agricultural Association to whom we have already alluded. With these remarks, (sections of a lecture delivered before the Agricultural Association,) which we have been kindly per-

mitted to use, and which may be valued for their practical bearing as for their scientific elucidations, we shall close what we have now to say on Electricity applied to Agriculture.

The letter, says Mr. S., which calls forth these observations concludes:

45. "It was *at first expected that manure would be of no further use*, but it is *now* said that its action will be more powerful with the *help* of this *new ally*."

It was indeed a fallacy to have supposed that *exciting* the frame would *feed* it. No living organization ever created *one atom* of its structure. It does but transform its elements; the vegetable those which nature *or art* have placed within the reach of its roots or leaves. These elements placed there, are as spontaneously sought and procured by it, however minute in the atom they may be, through the roots, or leaves, as would be similar by the animal who sees a hay-stack; and they are *equally indispensable* to both. If previous vegetation has taken up the food of the soil, and the crop has been carried to a market, it should be recollected that that act is the act of man in his political and social relations; that Nature *knows nothing of it and does not provide against it*; what she takes up *she gives back again* to vegetation—because, under her administration it generally perishes on the spot, and in so doing restores the elements of organization back to the soil again, with the accumulations from the atmosphere, and the water and ammonia of the air, by decay, equally fitted *in ten thousand successions*, for as many renewed appropriations to the same uses. If it has been carried off by the cultivator, he should remember that in selling the crop he is called on, as *he values the capital invested in the price of his land, to restore it*, in so far as he stands indebted to the *soil* for it; that all of the price he obtains *beyond* what will *replace* the *fertility* of his soil is *his gain and no more*. To appropriate more is *literally selling* (or lessening the value, which is the same thing,) of his land.

46. When he seeks, through electricity, to force the vegetable, he is merely calling on the functions of the structure to *take up* more of the elements contained in the soil or the atmosphere, and, referably to the products realized, they must be found there either at the hands of nature, *or of his art*. Without *this* his electricity will do him no good; but he may justly anticipate that in vitalizing and energizing the functions of the vegetable frame (as he thus may do with the aid of electricity) through the manuring elements of the soil, he *rateably, but no further*, enables the organization, through *this augmented vitally electric force*, to seize upon, and, through decomposition, accrete the hydrogen of the water—the elements of the soluble ammonia, and carbonic acid of the soil, of the aeriform carbonic acid of the air, and what else of the primitive rock in its disintegrated and soluble state may be there. *Thus* Nature referably will assist the vegetable with elements for his gain; and, as he forces the structure, through accumulated hydrogen, carbon and ammonia at the roots, *back towards* the luxuriance of the carboniferous era he may also conceive that he may, referably to seedless and flowerless vegetation, and, to a given extent also, as to the flowering and seed bearing races, *apply accumulated* Electricity.

It is an undoubted fact, which may be shown by a hundred fac-simile plates in my possession, that the vegetation of that era was, not only as luxuriant as I stated in my previous lecture, but that it was then *twenty fold what it now is*.

48. The question, and *the only one*, then, is—Hydrogen and carbon, with the other requisites, being *naturally* or *artificially*, and *rateably supplied*, how far will Electricity, in connection with them, *safely and profitably* assist in the operation, in one or both of the ranges of the vegetable existence to which I have adverted. This, as I have before said, can only, as I apprehend, be determined by practical observation and experiment. It may, as a matter of pleasing instruction, be as well essayed in any part of the city, as in the country, in the *ordinary plants* of a family.

It is what they seem to be trying in Europe. It is what we should try here too, if we mean to place and keep our intellects on a par with theirs.

W. A. SEELY.

New-York, March 3, 1845.

DURHAM OXEN.

To the Editor of the Mark-Lane Express:

SIR: It may be new to many of the readers of your valuable journal, to learn the particulars of the best ox ever bred in England. This wonderful animal, commonly called the Durham Ox, or Day's Ox, I saw several times, and knew the owner, Mr. John Day, well. The said Durham Ox was sold to Mr. Bulmer, of Hamley, near Bedale, for public exhibition, at the price of £140; this was in February, 1801; he was at that time computed to weigh 168 stone of 14 lbs., his live weight being 252 stones. Mr. Bulmer having obtained a carriage for his conveyance, traveled with him five weeks, and then sold him and the carriage at Rotherham, to Mr. John Day, on the 15th May, 1801, at £250.

On the 21st of May Mr. Day could have sold him for 500 guineas, on the 13th of June for 1,000 guineas, and on the 8th of July for 2,000 guineas. Mr. Day traveled with him six years through the principal parts of England and Scotland, till at Oxford, on the 19th of February, 1807, the ox dislocated his hip bone, and continued in that state till the 15th of April, when he was slaughtered, and notwithstanding he must have lost considerably in weight during those eight weeks of great pain and illness, his carcass weighed, at 14 lbs. to the stone, four quarters, 165 stone, 12 lbs.; tallow, 11 stone 2 lbs.; hide, 10 stone, 2 lbs. At eight years old this wonderful animal weighed, alive, 83 cwt. 3 qrs., the greatest weight ever known; he girthed in the least place, behind his shoulders, 11 feet 1 inch.

This large, handsome ox, brought the Durham cattle into such a high repute; nay, this ox speaks volumes in favor of even a single cross of this blood, for the ox was the produce of a common cow, which had been put to Favorite, at five years old. This single cross striking the admirers with amazement, what a great mistake there has been in not crossing all coarse beasts in Great Britain and Ireland with the pure Durhams! I have no doubt but the Dutch cattle, and most other foreign beasts, will be crossed with them, which will not only put some fat on their backs, but will marble their lean meat with fat, and make them more suitable for our roast-beef-eating metropolis, London, the best and greatest mart in the world.

THE DISEASE IN POTATOES.

VARIOUS THEORIES—THE LAST ENGLISH SUGGESTION.

When it is considered that the Potato Crop of the United States is set down at more than a hundred million of bushels, it will be admitted at once how important it is to discover, if possible, the cause of any disease which may seriously threaten a branch of industry which is followed and much relied upon for subsistence throughout the whole country; for there is not a State in the Union which does not look to it as the principal culinary vegetable. Even in Arkansas, the crop is estimated at more than 50,000 bushels. New-York is put down at 26,553,612 bushels, and, what we should not have expected, the crop of North Carolina, prior to the last census, is stated to have been 4,517,863 bushels, though we suppose the mountain ranges of the Southern States to be exceedingly well adapted to the growth of this important product. In her more than 8,000,000 of bushels of Potatoes, Vermont doubtless finds a great support to her successful sheep husbandry.

The following paper is found in a late number of the London Gardeners' Chronicle. What creates some hesitation in giving full confidence to the theory of the writer is the fact that this disease should have appeared simultaneously in so many parts of the world. A statement appears from a friend of the Editor of the American Agriculturist in his third volume, page 354, to the effect that the disease is to be ascribed to an *insect* attacking the seed Potato when planted. He says:

"In the year 1843 I planted a field of several acres in drills, harrowed the ground level, and top dressed it with lime and charcoal dust. The yield was 432 bushels per acre; at the same time the Potatoes throughout the neighborhood were decayed. This year I planted the same seed in the following manner: The ground was thrown into drills, and manured heavily; the Potatoes were cut into sets of single eyes fourteen days before required for planting, and covered with plaster and lime; they were then placed in the drill, 9 inches apart, tops, centres, and ends separately, to mark the difference in growth; and each alternate three rows then covered with different substances, such as lime, sulphate of ammonia, silicate of potash, &c. When dug, they were all sound except a few rows on which nothing had been used but the manure, and these were decayed, although received only three weeks before planting directly from France. The only reason that I can give why my Potatoes have escaped the rot is, that the above substances used in dressing them were offensive to the insect."

We shall omit nothing which may seem calculated to throw light on this interesting subject. In so doing, as must always happen, many conjectures will be hazarded and suggestions thrown out that may prove fallacious; but it would not be either fair or safe for us to withhold what the reader might deem to be significant and at least worthy of experiment; and, after all, it is equally the interest and the duty of the Farmer to make experiments, and, let us add, to report the result *for his Library* and for the common benefit.

We have no doubt of the soundness of the theory which recommends that Potatoes, as well as fruits, be occasionally renewed, *from the seed.* New and improved varieties may be expected, after a few generations—with some things sooner, with others later. It is said that by planting the stone of the most worthless peach, a fine variety may be expected in three or four generations; the same as to the apple and pear in a somewhat longer time. The famous Mercer Potato has been clearly traced by Mr. Kennedy, near Meadsville, Pennsylvania, to its origin in the seed apple.

THE DISEASE AND FAILURE OF THE POTATO CROP EXPLAINED.

[The following are portions of a paper on this subject, by A. Patullo, Esq., of Edinburgh, read before the Highland and Agricultural Society, on the 7th instant. It has since been published as a separate tract.]

As to the early history of the Potato plant, it appears to have been imported into Ireland from South America more than 200 years ago, and introduced into this country from Ireland about the year 1740, which was a year of scarcity, when a few were brought over to Scotland; but their culture was then confined to the garden, till about the year 1753 or 1754, when they were raised in the field; but the plant has not been extensively cultivated in this country more than seventy years. There are great varieties of the Potato; and the kinds first known in this quarter were the Kidneys, the Leather-coat (called from the roughness of its skin), the Blackamoor (that is, the dark-colored Virginia), and the Killimancas (query, the Dons), which appears to have been a cross between the white and red. The prevailing kinds in our day are, the Kidney, Perthshire Reds, Dons, and Buffs; the latter two being at present most extensively planted in this neighborhood. There is also another species called the Surinam, or Hog Potato, or Yam: this variety is not eaten by the human species, at least in this country, but it has two valuable properties to recommend it, as it is very productive, and has never yet been

known to fail; as also the American Early, which always succeeds.

The first system of degeneracy of the plant in Scotland appeared about the year 1780, when the distemper, called the curl, first appeared in the crop; but it then occurred so rarely, that very little notice was taken of it; but the evil gradually and extensively increased, when, about the years 1784-5, the whole crops of the Lothians were seriously affected by it. A remedy, however, was accidentally discovered, by changing the seed from the high country; and this was and has been the only remedy for the disease of the curl to the present day. At this early period, the seed procured from the high country had to be changed every three or four years; but it was found, as the cultivation of the plant increased so did this disease; and from about the year 1820 up to the year 1835, it was customary to change the seed every other year; and from 1835 to the present year, 1845, the whole seed had to be changed yearly, as it was found that a new disease appeared in the fields: the seed only partially germinated—great blanks or failures took place—and many farmers almost lost their whole crops. This disease in the seed was called the wet and dry rot; and, in many instances, seed from all situations, high and low, has now also failed. These two kinds of disease, which destroy germination, are variously accounted for. Some ascribe the cause to maggots and flies who feed upon and destroy the seed-plants; but this is a consequence, and not a cause; for maggots or flies are only to be found on diseased or putrid vegetables: they riot and banquet on putrefaction: it is their natural food, and there they are only to be found. Plant, then, a sound Potato in a good soil, and properly treated, it will find its way to the surface, and produce a good crop in defiance of all maggots and flies. The seeds of disease, then, must be in the constitution of the plant.

In examining a diseased Potato, which has, as commonly called, blind eyes, and will not germinate, it is plain that there is canker on the skin, and plague spots all over it. This, if planted, will certainly be attacked by the maggots and flies; but the plant is in a state of decay or putrefaction—in fact, a *caput mortuum*—and it properly belongs to the flies and maggots by right of inheritance. The great object to be attained, then, is, to plant sound seed, and the maggots and flies will not relish it. As the crops on the high lands are early checked by frost, and the tops or haulm soon destroyed, they do not fully ripen; and this circumstance has induced farmers in the low districts to take up their crops for seed in a green or unripe state, in order to imitate the operations of nature on the hill grounds; but this plan has also failed. Seed has been often raised from the apple, but in two or three years it curls and degenerates.

It is now generally allowed, and the idea long entertained, that it is quite impossible to raise seed Potatoes without being affected with curl in a low situation, or in a high temperature free of degeneracy or curl; but at an altitude of 400 feet, it then entirely disappears. In this there appears to be a very remarkable peculiarity in the nature and constitution of the plant; but in looking to its origin, general history, cultivation, and general management in this country—its success and failure—I have been led to a far different conclusion. Indeed, from what I have already stated, it must clearly appear to every one, that there can be only one cause for the failure of the plant, viz., *over-cultivation*. The crop too often repeated on the same soil, and too much stimulus applied to the plant, has weakened or destroyed its vital energies, and rendered it incapable of reproduction. In the cultivation and general management of the plant, we have entirely lost sight of nature, which always follows the moderate or middle course; and, by a long train of mismanagement, we have nearly lost this most valuable root; and if we shall persist much longer in following the present unnatural and inconsiderate course of treating it, we shall certainly lose it. Who can contemplate a luxuriant crop of growing Potatoes in full bloom, but must reflect on the immense stimulus applied to produce such a mass of stem, foliage, and blossom, and, at the same time, how much the roots or tubers must be enfeebled and exhausted in producing it? The first practical experience of failure which I met with on my own farm struck me most forcibly. In the year 1837, I had a small quantity of Potatoes for seed, which I had received from the high grounds (the farm of Bonally, in the high part of the parish of Colinton). I thought them very fine; and having selected the best for seed, I manured the ground heavily in the drill with the richest and best dung on the farm, in order to have as many as possible for planting the succeeding year. The extent of ground was about an acre, and I certainly obtained an excellent crop; but *as I never planted a whole field in the same way without some variation, by way of experiment*, (a hint here that will not be lost on the observant reader,) I planted a few drills of similar seed next to them, very moderately manured, and at the time of taking up the crop, this acre was still green in the tops, and we commenced to take up the crop at the opposite side of the field, making them the last to be taken up. The few drills already mentioned were pitted on the end of a pit not meant for seed, and the produce of the acre was pitted by themselves. Next season I planted the greater part of the produce of the acre in the ordinary way, and lost one-third of the crop. I also planted the produce of the few drills in the ordinary way, and had a little curl, but not a single blank. I was very particular in all the operations of pitting and cutting, and I am quite sure that the seed was not injured in that way.

I come now to state an instance, and one of many that can be adduced, which most clearly and satisfactorily supports my assertion, viz., that a heavy crop, grown in any situation or soil, will always be found to produce, in a certain degree, *degenerate and tainted seed*. The following is a letter I lately received from Mr. Cunninghame, tenant, Harlaw, in the parish of Currie. This farm is situated near the foot of the Pentland Hills, at an elevation of more than 500 feet above the level of the sea. The following is a copy of Mr. Cunninghame's letter:—

"HARLAW, May 5, 1845.

"*My dear Sir:* The new land in the Bogpark was never in crop in my remembrance, either white crop or green. I drained the land every furrow: they were old round-about ridges. I plowed the land, and part of it I sowed with oats, and harrowed the Potato land along with what was intended for oats. In the Spring of last year—about the end of April, the 20th or 24th of the month—I employed two men to plant them, and put them in with the spade:

they put the line across the furrows, and made a rut on each side of the line; turned out the sod, put in the dung about 12 tons per acre, and then returned the sod. I employed a boy with a hoe after them, to blind any of the chinks; and after the crop was well brairded, I dug or rather scraped with a spade betwixt the drills, which were 28 inches wide, and about 20 days after I drew the scrapings to the plants with a hoe. I measured several drills at lifting-time, and the produce was nearly as possible 100 *bolls per acre*—(a boll, we believe, is 400 pounds.)—I planted one drill with Irish Cups, and the crop was good; one drill with Buffs—they were also good; one drill of Reds, from Ratho (the low country), which turned out a bad crop; the rest was from Biggar-shiel, all Dons. My other Potatoes were planted in the field adjoining.—About the middle of May I gave them about 20 tons of dung per acre. I began about the first week of October to lift them, and lifted the bog-crop first, and they were all pitted on the same plan; the pits about 4 feet wide, and about 5 inches taken out of the bottom, the Potatoes put in, covered with straw, and afterwards about 4 inches of earth. I put in wooden ventilators, square boxes made of paling-rail, with openings at the bottom, about 2 feet down amongst the Potatoes, and the other end above the pit. I let them (the ventilators) stand this way for four or five weeks, and then put on about 10 inches of earth; as soon as I saw an appearance of frost I stopped them with straw. I may add that the boxes ran short, and I finished with straw, which seemed equally well to answer the purpose. I have just put the last of the Potatoes in the barn to-day, to cut for seed. Those from the new land and great crop do not appear to be so good seed as my other Potatoes, which were not half the crop: there seems to be more blind-eyes amongst them. My going or cropping land has lain twice in pasture during the last 15 years. I do not think it possible that any of the seed which I planted could be heated after cutting; and I had no opportunity of knowing whether those planted had been heated before I received them: of course they have not been heated this season. I forgot to mention that the bog-land, before draining, was all naturally wet. The reason I gave it so little manure was, that the cattle had lain in that part of the field, and the land was enriched from that circumstance.

"I am, &c., JOHN CUNNINGHAME.

"P. S. My brother at Kenleith got some seed Potatoes from the west country—nine bolls from new land, and one from going or cropping land and he says that the latter is the best seed, having fewer blind-eyes."

The above completely confirms what I have already advanced, viz., that a heavy or overgrown crop of Potatoes, in any soil or situation, will always yield bad Seed-Potatoes; and that over-cultivation is the sole or chief cause of the degeneracy of the plant.

It seems self-evident, then, that the crop first degenerated in the rich and cultivated districts of the low country, producing curl in the plant; that, as the cultivation of it increased, the curl increased, and a change of seed was found necessary from the high country; that within these ten years past, in addition to curl, that blanks or entire failure of the plant has taken place in our fields, and the disease of curl, and the complete or partial failure, has kept pace with the extended cultivation of the plant, and in the exact ratio of the quantity of stimulus or manure applied; and that the first blanks in the fields have appeared to have continued since the manure has been so much increased to the crops, viz., during the last ten years, the quantity of manure applied to the crop having been increased one-fourth generally all over the country, as the increased quantity of manure (when the crop has succeeded) has in a very remarkable degree increased the return, to the extent, in many cases, of one-third more Potatoes; and in some instances the crop has been doubled. But as the crop is increased in quantity, so does it decrease in quality; and very nearly in the same ratio.

That the plant has continued longer in the hill-districts, free of curl and failure, is no argument against my theory, as it is the poverty of the soil and the want of manure that have saved it. It not only has received less manure—for they have little to give it—but it has not received at its roots so much of that heating and stimulating article, horse-dung or stable-manure; which I attribute as the cause of assisting materially in the deterioration of the root. The crops also, until of late years, have not been so often repeated on the same soil; and a change of crop is of great advantage to the health and well-being of any plant.

I come now to the cure or remedy of the disease, or the best means of procuring and raising good seed—as I do not yet despair of seeing good seed, and the best that can be raised, to be found in the early and highly cultivated districts. It must, of course, be obvious to all, that, if possible, seed should be obtained from South America; but as it would not be possible to procure more than a very limited quantity, we ought to try what can be done to improve those of our own country. I would recommend to select the best varieties, and raise from the apple; but, in the mean time, to have the best and soundest seed for present planting—always, of course, avoiding the produce of a great crop, grown in any situation or soil. The land intended for seed should be plowed deep in the autumn, and, if possible, by the trench-plow. The drills to be 30 inches wide, and manured moderately with, if possible, a mixture of earth; and if earth is not previously mixed with the manure, a little may be drawn into the drills above the manure, and before planting the seed. Mr. Dickson, Saughton, near Edinburgh, who has been very successful in raising good crops of Potatoes, is very judiciously, this year, mixing all the manure intended for Potatoes with earth. The ground intended for seed should be planted with whole Potatoes, and about 14 inches apart; or the Potato cut in two, and planted at 10 inches—(both may be tried;) the plants to be placed near the surface, and never highly earthed up by the plow, as it is natural for the tubers of the plant to run upwards; and the more of them, in ripening, that may be exposed to the sun and air, (greened,) they will make so much the better seed. To be taken up rather green or unripe than otherwise, but approaching to a ripe state. To be placed in pits, (in an airy situation,) at about 2½ feet at bottom: they may be carried up pretty high, and the pits may be made of a tolerable length. They should have first a little earth thrown over them—say half an inch—and then a good covering of straw, finishing with a few inches deep of earth, as it is the straw which will defend them from frost; and a few straw funnels, at short distances, is all that is necessary.

The seed Potatoes should be planted by the 1st of May, at farthest. In the late districts, as the seed may be injured by the frost before taken up, they could be well earthed up by the plow a short time before the frost may be expected; and the same may be done in the low country; but of course they do not run an equal risk so early in the season, although we all know that a very slight degree of frost will injure the Potato. Those not meant for seed ought to be managed much in the same way; giving the land, however, more manure, and planting deeper: as the Potato, if greened, will of course be unfit for food. I would advise the experiment of topping or cutting the Potato-tops when too luxuriant. It may be done in this way:—A person, with a common harvest reaping-hook, about the time of the decay of the blossom, should be employed to go along the drills and cut off the tops, about 2 inches or so below the blossom: this will not only prevent them from seeding, but will check the luxuriance of the stems, and save the exhausted roots or tubers.

I have always thought that the produce of any overgrown or luxuriant white crop produced inferior seed; and I suspect that it will be found that all white and green crops may be too highly cultivated. It is well known that turnip-roots rot and decay prematurely from the application of too much manure. I have also long entertained the idea that smut in wheat, barley, and oats, has always arisen from over-cultivation; and, if we shall find out the cause, we can have less difficulty in finding a remedy. I therefore hope that Agriculturists will assist me in exploring the field of over-cultivation, which has seldom or never been thought of, as almost every Farmer has gone on upon the principle that too much stimulus could not be applied: the crop may have been too luxuriant to be profitable, but the degeneracy of the seed or root has been invariably lost sight of.—We must, then, bear in mind that Dame Nature may be assisted or followed with success; but if we shall attempt to deviate from her law, we are sure to fail.

Note.—The author of "The Problem Solved," in a very ingenious treatise on the subject, has pointed out the probable effects of cutting the Potato in the Spring or bleeding season, and also on producing and raising seed from the apple. In planting the Potato whole, of course this objection would be obviated.

I have mentioned that the American Early, and the Surinam Potato or Yam, have not been known to fail. Neither of these has been extensively cultivated; and although not an absolute failure, yet it is well known that they have degenerated; and the Yam, for this and other causes, has nearly disappeared from our fields. My plea is, that long-continued and extensive cultivation will finally destroy the plant; and the Surinam and American Early form no exception to the theory advanced.

POTATOES.—Early in January last I planted a plot of ground with Soden's early Oxford Potatoes; half of the plot I planted with cut sets, the other half with whole Potatoes. They were all planted 5 inches in depth, and were not covered with any manure or litter of any kind.—The frost has not injured the whole Potatoes in the least, as they have all come up and are looking very healthy; but it has entirely destroyed the cut sets. They were all planted in a stiff, damp soil, which was frozen for several inches below them. [C. J. Perry, Handsworth.

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AFTER-CULTURE OF DRILL POTATOES.—SIR: The after-culture of drill Potatoes is usually done by paring or cutting the drill, at each side of the plant, and within three inches of it; then the drill harrow and roller, if necessary, are applied, to break any lumps the harrow may bring to the surface; weeding, &c. is then performed; the fine earth is then put to the Potatoes by a double moulding plow; this operation is again executed when the work is finished. It is after this fashion that all the practical farmers act, that I know of, with the exception of one, who, I admit, is entitled to take the first place, as a really practical and successful agriculturist. His plan is, not to pare or cut his drills, but to cut the centre between them; and then put the earth up to the plant. His reason for not cutting is, not to injure or disturb the roots; but he takes great pains in hoeing and weeding.

It may be, that some information can be supplied through the columns of the *Gazette* on this practice; and perhaps you might favor the public with your own observations, on the relative merits of both plans.

[In the course of our practice, we never had the earth cut away from the drill, unless by the coulters of the scarifier; and this we consider necessary, in order to have the ground properly cleared, and kept loose and open for the admission of air. This can be done with safety, in the early stages of the plant, before the roots have extended themselves; yet we consider a distance of three inches from the plant too little, as the manure would be liable to be dragged out, and the sets displaced. Six inches on each side of the plant, will be near enough in the first instance; and in our succeeding application of the implement, it must be contracted according to the increased space occupied by the roots.]

THE POTATO PROBLEM SOLVED.—The Cause of the Disease in the Potato pointed out; Remedies exemplified; and New Systems of Potato Cultivation proposed. By Robert Arthur. W. H. Lizars, 3 St. James's-square, Edinburgh. 47 pages.

ANY new suggestion towards the explanation and prevention of the Potato rot is worthy of attention and trial, and especially one so well founded on *analogy* as that brought forward by Mr. Arthur. In reference to the propagation of plants by means of eyes he quotes the following passages from Dr. Lindley's work on the "Theory of Horticulture."—"The only species very generally so increased, are the Potato and the Vine." "In order to insure success in this operation upon the Vine, it is only necessary that the *eye should be dormant;*" and reasoning from this on analogy he recommends Potatoes to be cut for seed at a period when the juice in them is *dormant*, so to speak; when in fact the set will not bleed at a cut surface. He shows, in a variety of instances, though not in so many perhaps as would be needed to prove "the Potato problem at last to be "*solved*," that the practice of cutting the Potato sets in Autumn instead of Spring perfectly answers. Perhaps the most striking confirmation of his views would be the general success of the Potato crop this year—for the sets, owing to the frost, must have been much in that dormant state which he recommends when cut this Spring. We could easily extract many interesting paragraphs from this little work, but we have no wish to *satisfy* the curiosity of our readers and interfere with its sale by transferring its contents to our columns. The book is written by a practical gardener, and well deserves extensive perusal.

AUTUMN-PLANTED POTATOES.—"Este" planted some Potatoes in October, following the advice given in the *Gardeners' Chronicle*.—The earth was drawn into a ridge over the sets, which were thus 5 inches under ground. The frost penetrated 8 inches, being tried on purpose, yet on examining the sets last week all that were examined were found unhurt and sprouting. Nearly a quarter of an acre was planted. [We have the same report to make; so that the frost question may be considered settled.]

POTATO CULTURE.—This being a subject in which every one is interested, I think it cannot be too much discussed, as every hint at this season must be of benefit to some parties. I have examined those of mine, planted in January last, and find the whole tubers now beginning to bud, but the cut ones are every one rotten, wherefore I consider it to be folly in any one to plant cut sets in Autumn or Winter. They cannot stand much wet without rotting, nor can they endure much dry weather, as then by losing the water which forms a great part of their structure, they equally become inert from what is termed dry rot, so that either too early or too late planting does not suit them, but as stated by a correspondent in last week's *Gazette* just when they naturally begin to show signs of vegetating. Of course it is clearly proved that as far as the safety of the seed goes whole tubers may be set at any time by a little care being paid to the manner of putting them in the ground, although, if to remain long in the earth, they should be carefully selected free from cracks or blemishes, for otherwise they would share the fate of the cut ones.

[John Thomas, Wem, Salop.

EXPEDITIOUS MODE OF PLANTING POTATOES.—(*From the Farmers' Gazette.*)—SIR: I see in this day's paper a remark regarding a speedy way of planting Potatoes; and as I have planted, in ten days, twenty-two English acres, which I think good work, I give you my plan:—

I have the field first cleared of weeds, and harrowed, so as to leave no obstacle in the way. I keep seven horses at work: two opening and closing drills as fast as they can go, the other five drawing out manure and sets (the manure being principally in the field.) I put two men to assist the cart-men in filling the carts, so as to occasion no delay. I keep also two men in the field, to assist in unloading, one working at each hind corner of the cart. The driver, standing in the cart, with his grape (fork) throws the dung into the middle drill—the two others manuring their respective drills on each side of him.—Three drills are thus dunged, while the horse is slowly moving onwards. After them I have three women spreading the grapefuls thus deposited, and three more dropping the Potatoes about ten inches apart. I have in this way, in one day, put in nearly three English acres—the one pair of horses opening and closing. The great thing is, to have all things ready before commencing, so that no time may be lost: and also to have sufficient hands, so as to prevent the horses from being kept unnecessarily idle.

Yours, &c. A SUBSCRIBER.

GYPSUM IN SOUTH CAROLINA.—The Southern Agriculturist says "a specimen of Gypsum was lately sent to Dr. Gibbes of Columbia, from Mr. Ingraham's on Cooper river. It resembles the gypsum of the Paris basin.

THE ATMOSPHERE OF HOT-HOUSES.—I am astonished that so great a portion of the horticultural world should still be content with the capricious and uncertain degree of atmospheric humidity in the great majority of hot-houses of the present day. We hear of nice little flanges or covers, of about an inch in depth, being cast, it may be with the piping; and which the hot-water man, of course, deems perfection, but which I consider play-things; and we sometimes hear of sudden deluges of steam being shot, as it were, from a 48-pounder, into the atmosphere of the house, which, for the space of half an hour, casts a London fog completely into the shade: and this is what is called following Nature, whilst both are equally unnatural.—What is wanted for vegetation in general, is an immunity from excessive humidity, as well as from fitful drouth. I am quite of opinion that no invention will ever excel, for simplicity and efficiency, a cemented brick trench, with the bottom pipe resting on it, and a permanent source of water in a cistern overhead, with a tap to run into the trench. The bottom, or return pipe, is seldom more than from 90° to 110° in most hot-water apparatus, and this imbedded in water, or partially so, will produce humidity sufficient for any orchidaceous or other hot-house. Houses supplied in this way possess an atmosphere exactly resembling a genial evening in May, and the only hygrometer wanted to prove this is the nose of a thorough practical man. In addition to this, I am of opinion that there should be apertures in the front wall, open night and day, and capable of graduation; this was long since recommended by the late Mr. Knight. By means of these the air will be in constant circulation, preventing stagnation on the one hand, and preserving a due proportion of the constituent and vivifying gases of the natural atmosphere on the other. Red-spider and such like pests will be seldom seen in such structures, provided a clever system of potting (founded on the permeability of the soil to the atmosphere, by means of thorough drainage, and the free use of undecomposed turf, with its native texture,) be conjoined with it. These front wall apertures, or ventilators, should enter just over the piping, if possible; the effect of which would be to carry the artificially moistened atmosphere through the whole body of the house. By the flange or other mode (in which sudden deluges of piping hot steam is produced) the furious steam is carried immediately to the roof of the house, where, of course, it is condensed, and descends in drip; and the greater the difference between the outer and inner atmospheres the greater is the amount of drip, and consequently the greater is the dryness of the atmosphere below, especially if the fitful cause of steam become suddenly short of supply. Although I advocate a constant source of pure air from the front, I would have the glass roof, if possible, as close as a Ward's Case; and now that the duty is to be removed from glass, I make no doubt we shall soon be enabled to bid defiance to both leakage and hailstones. Of course, I would have ample ventilators at the back, to be used in cases of necessity; these, however, in general are mere wasters of heat and moisture. Very different is the office of the front apertures.

[R. Errington.

GRAFTING THE CHESTNUT ON THE OAK.—In the department of Correze, an oak, engrafted eight years ago with the chestnut, has produced at length chestnuts of a good quality.

FEEDING OF ANIMALS.—Hay is the kind of fodder most frequently used, and may be considered almost as the normal food of those animals which are of the most importance in the farm. It is on this account that it may conveniently be taken as a standard by which other kinds of vegetable food may be compared. The quality, however, of hay varies extremely; our standard, therefore, must be good meadow hay. It appears, from the analysis I have made at various periods, that in the state in which it is consumed it contains from 1 to 1½ per cent. of azote. As, however, the determination of its nutritive value is of great importance, I shall point out the mode of proceeding, in order to obtain specimens representing as fairly as possible the mass from whence they are taken.—The method is applicable to other kinds of fodder. Hay is composed of four distinct parts, each of which has a very different nutritive value. It is of consequence, then, that in a specimen taken for the determination of the azote it contains, each of these parts should be properly represented. I distingush in hay—1, the woody stems; 2, the slender straws or stems to which the leaves were attached; 3, the leaves, flowers, and seeds. A small portion of hay is taken and carefully sorted, and the parts are weighed separately. In a specimen of strong meadow hay, made in 1841, I found—

	lbs.		*drachms.*
Woody stems	2,404	Taken for analysis,	680
Straws or very slender stems	8,493	" "	239
Flowers, leaves, and a few seeds	1,764	" "	497
Mixture analysed			1,416

My analysis gave—

Azote, per cent	1.19
Contract hay for Parisian Cavalry, 1840	1.21
Hay from Alsace of 1835	1.04
" " 1837	1.15
Mean of four samples, in the state in which it is consumed	1.15

In this state it contains from 11 to 12 per cent. of moisture, which is dissipated by desiccation. Since albumen, caseum, and vegetable gluten, contain 16 per cent. of azote, the animal matter (or flesh) may be estimated at 7.2 per cent. Hay does not, however, always present this quantum of azote; that, for instance, from marshy land contains decidedly less. Some, on the contrary, is more rich in the animal principle. The same hay will give a larger proportion if the woody stems which it contains be removed. The second crop is generally more nutritious than the first, as we have often proved at Bechelbronn; but it is considered, I know not why, to be less fit for horses. Perhaps this arises from its being more liable to be more or less spoiled in the stack, in consequence of its being made in damper weather.

A second crop gave on analysis	2	per cent of azote.
A choice sample of the first quality	1.29	" "
Hay divested of the greater part of the woody stems, and consisting principally of bottom	2.1	" "

These examples are sufficient to prove that, in considering the substitution of other food for hay, attention must be paid to the quality. In the table which I have prepared, I have taken, as the basis of the equivalents, ordinary meadow hay, containing 1.15 per cent. of azote and 11 per cent. of water. The importance of a table of equivalents, as regards different kinds of food, is duly appreciated by all agriculturists; and great thanks are due to those who have taken pains to arrive at a knowledge of their relative value. The mode of using such tables is very simple. The numbers placed below the value of hay indicate the weight which may be substituted for 100 lbs. of hay. For instance, according to Block, 366 lbs. of carrots may be substituted for 100 lbs. of meadow hay. According to Pabst, 60 lbs. oats=100 lbs. hay.—Would we then substitute Jerusalem artichokes for 3.3 lbs. of oats, which form part of the food of a horse, we find in the table 60 lbs. of oats=274 lbs. Jerusalem artichokes, whence we conclude that it will require 15 lbs. of the tubers to compensate the above named weight of oats.—A certain knowledge of the relative value of food may be of real benefit in rural economy, as it may guide the farmer in his determination of what kind of diet is the most profitable. Suppose, for example, 165½ lbs. of potatoes to be worth 10*d.* in the market, when 220½ lbs. of hay is worth 5*s.* Then, if we admit, in accordance with theory, that 220½ lbs. of hay=695 of the tubers, it is clear, on comparing the price of these equivalents, that there is a considerable advantage in buying potatoes, for the 695 lbs. of potatoes would cost only 3*s.* 6*d.* At this price it would be beneficial to the farmer to sell his hay and replace it with potatoes. The equivalents which I have deduced from the analysis of various kinds of food agree in most cases with the numbers assigned by practical men; sometimes, on the contrary, they differ remarkably. It must, however, be observed, that the equivalents of practical writers exhibit differences of the same nature. Schnee and Thaer give as the equivalent of 100 lbs. of hay 666 lbs. of wheat straw, whereas Flotow gives 175 lbs. According to Meyer, 290 lbs. of turnips=100 lbs. of hay, whereas Middleton gives 800 as the equivalent, a result which accords with that of theory.—Block gives 30 as the equivalent of peas, while Thaer, who is quite as high an authority, gives 66. The same agriculturist gives 460 as the equivalent of mangel-wurzel, while Pabst and Meyer give 250, and M. de Dombasle 261.—Making every allowance for the difficulties of the subject, it is hard to account for these great discrepancies. As regards the marvellous agreement which the practical results frequently present, one cannot but be convinced that authors have often silently transcribed the results obtained previously by others. It is often impossible to decide whether the data of agricultural works are original or merely transcriptions.—Every one at all acquainted with experiments will at once decide that 11 isolated observers can never have arrived in the case of Lucerne hay at the exact equivalent of 90, or that five have obtained precisely 600 for Cabbages.

[Boussingault.

MANURE FOR ONIONS.—I have always succeeded in the following way, being the surest and most economical:—Take off about 4 inches of the earth on the surface, the length and width of your bed, so that the ground under be solid. Spread stable-dung well over, about 4 inches in thickness, and then cover the same over with the earth taken from the surface. Sow your seeds rough, and you are almost sure of an abundant crop; and the land is the best for parsnips and carrots the following year.

[R. F. J., Ottery

EDITOR'S TABLE.

AGRICULTURAL JOURNALS.—We should be glad to give in an early number, a list of all the Agricultural papers in the Union—their place of publication and terms. The matter of "exchanges" is one entirely under the control of the Publishers of the FARMERS' LIBRARY, and they instruct us to say, that they will be happy to exchange with all Agricultural Magazines and Periodicals, without reference to difference of price. Should any of our cotemporaries deem themselves obliged by this offer, they will best know how to make that feeling apparent. The wish is to maintain with them, a rivalry, only in doing good to each other and to the *country*.

WASHINGTON'S LETTERS ON AGRICULTURE. —We cannot do better than employ the words of a much esteemed colleague, the Editor of the New-England Farmer, who says of these letters:

"Every thing that emanated from the pen of this illustrious man, has a sacred value to all true Americans. His letters on Agriculture, addressed to Sir John Sinclair, have recently been published by Franklin Knight, of Washington City, in a style that renders their possession peculiarly desirable by every American farmer, and, indeed, by *all* Americans—the letters being engraved from the original. and being perfect *fac similes* of WASHINGTON'S hand-writing. This mere fact of itself, renders the letters of great value to the American public."

To the above we add a single suggestion or inquiry—whether it might not be well to place these letters in the common schools of the country, were it only to familiarize the rising generation with the autograph of the Pater Patriæ, and the better to impress on it from such high authority, his sentiments as expressed in one of his letters to Sir ARTHUR YOUNG:

"The more I am acquainted with Agricultural affairs, the better I am pleased with them; insomuch, that I can no where find so great satisfaction as in their innocent and useful pursuits.

NOTICES OF NEW BOOKS.

Even if we had time to read and to write *critical* notices of the books which may be laid on our table; we are not sure that it would not better comport with justice to the author, and with the interest of the publishers, to make these notices *descriptive*, rather than *critical*; only giving our readers an inkling of their contents, and leaving them to judge how far the subjects as thus indicated, invite further acquaintance with the work. On this principle we shall proceed, and even for this we have not room in this number to notice all those which have come latest to hand. The following is a most captivating title of one scarcely dry from the press of Messrs. Wiley & Putnam, from an author of well established reputation.

THE FRUITS AND FRUIT TREES OF AMERICA; Or, The Culture, Propagation and Management, in the the Garden and Orchard, of Fruit Trees generally, with descriptions of all the finest varieties of Fruit, native and foreign, cultivated in this Country. By A. J. DOWNING.

We have not had time to examine it, but who need fear to enlist under such a flag and flag-bearer?

☞ Several works from those eminent publishers of Philad. Messrs. LEA & BLANCHARD, have been kindly forwarded through Messrs. Wiley & Putnam. These appear to have been either edited or *authored*, by Mr. J. S. SKINNER, and as that gentleman is a near relative of ours, we do not feel at liberty to speak as fully of them, as otherwise we might do. One is an American edition of

YOUATT ON THE HORSE.—In this case, more than 60 pages have been added by Mr. S. partly on the American Trotting Horse, besides an elaborate essay on the natural history and uses of the Ass and the Mule.

CLATER ON THE DISEASES OF HORSES, by the same author, editor and publishers, is a smaller work. Speaking of them both, the American Editor in his preface, referring to the merits of the English copies, says: "The two are adapted to meet the demands of the scholar and the groom; the former (Youatt on the Horse) claiming a place in the Library of every gentleman, as this one should should be found for daily reference in every stable, along with the curry-comb and the brush." Yet another volume, by and from the same parties.

DISEASES OF SHEEP AND CATTLE.—To this Mr. Skinner, has appended a treatise on the Economy and value of Oxen, for farm labor, with hints and illustrations for breaking, gearing, &c.

THE SPORTSMAN AND HIS DOG, by J. S. Skinner, is the last, and very recently from the same publishers. The author attempts to justify his avowed partiality for the canine race,

when of *established and pure lineage*, by citing the example of illustrious men. To other great names he might have added that of the immortal Linnæus, who says, among other things, "he is the most faithful of all creatures; dwells with man; fawns on his returning lord; bears not in his memory the stripes he inflicts upon him; runs before him on his journey; looks back at a cross-way, and seeks obediently that which is lost; holds watch by night; announces the approach of any one, and guards the property."

"THE FARMER'S AND EMIGRANT'S HAND-BOOK," is an acceptable offering, from the prolific press of Messrs. D. APPLETON & Co. distinguished for discrimination and enterprise in "their line." It has already gone to a second edition, and ought to be valuable,—"comprising the clearing of the forest and prairie land—gardening—farming generally—farriery—cookery—and the *prevention and cure of diseases!*" All these guide books, by the bye, seem to take it for granted, that every man from abroad, is to wend his way to the far *West;* as if there were not millions of acres of uncultivated land left in the *"old thirteen!"* We wish the Southern people would take measures to let Europeans know that there is such a water as the Chesapeake Bay, and such a region as the mountain sides and mountain vallies of cheap and rich land, in a climate so healthy as to need no books to teach either prevention or cure;—where there are no fevers, and where none die of consumption except *Doctors!* If they will provide a conveyance to these lands, and employ a certain "writer, under the signature of WILLIAM DARBY," to write a "guide book," the New-York public works will no longer carry *all* the emigrants that come to America, through to the lakes on their way to Oregon.

☞ BOUSSINGAULT'S WORK ON RURAL ECONOMY has been well reprinted by D. Appleton & Co., and is without doubt a work which well illustrates the existence of a highly improved taste in what concerns the science and the literature of Agriculture. True, "Mr. Geo. Law, Agriculturist," repudiates the translation, as not being genuine; but, bating any want of literal accuracy, or nicety in the translation, the book contains a mass of very valuable information for every Farmer who desires to keep pace with the progress of scientific development in all that is connected with his pursuit and chief business in life.

☞ To Mr. S. S. RANDALL, General Deputy Superintendent of the Common Schools of New-York, we are much indebted for a copy of his clear and admirable "DIGEST OF THE COMMON SCHOOL SYSTEM," and for the REPORT OF THE SUPERINTENDENT OF COMMON SCHOOLS FOR 1845, no less for the manner than the matter of the offering. Well does this volume accomplish the "design" of the author, as thus announced in the preface:—

"A historical sketch of the origin and progress of the system from its inception to the present period, accompanied by a brief exposition of its present condition, has been annexed to the work, with the design of rendering it more acceptable as well to our own citizens as to those of other portions of the Union, who may feel an interest in tracing the gradual advancement of our legislation on this important subject, and in ascertaining the prominent features of our system, as moulded by the successive improvements consequent upon an experience of nearly forty years."

With the concurrence and hoped-for aid of Mr. R., we shall use these volumes in a manner which may serve to assist the particular efforts of true philanthropists in other States where endeavors are beginning to be made to establish general and practical systems of education—a matter which is never to be lost sight of in all plans for the *improvement of the Agriculture of the States.* For as surely as the continued fertility of land depends on the nature of the substratum, so surely does the success of every scheme for meliorating the condition of any people, in any and in all their branches of industry, as well as in their morals, depend on their being well instructed in all that pertains to the occupations on which they are to rely for their support. An ignorant people can never be a prosperous one; they are ever liable to be abused, for there are always demagogues and hypocrites on the lookout, ready "booted and spurred" to ride them.

It shall not be our fault, according to our poor ability, if the Agricultural class does not get its share of knowledge of what science is discovering and experience putting in practice for their benefit.

VEGETABLE SILK.—The latitude of Tripoli, in Barbary, whence this plant was received, is 32° 51′ 50″ North, longitude 13° 11′ 42″ East of Greenwich.

The general result of the meteorological observations which accompanied the paper on Vegetable Silk was, first, as to RAIN: The aggregate for the year was 18·05 inches, and the writer says that in fourteen years' residence there he does not recollect ever seeing a long-continued rain, nor a day of "entire cloudiness." As to HEAT, the maximum was in July 106° Fahrenheit; the minimum 42° in January.

There are other meteorological views presented in this table, such as observations on the *Winds* and *Currents*, which may prove interesting to Professor Silliman, Mr. Espy and others, whose researches have contributed to

give us a name and a standing among the *Savans* of the world.

We are aware of the resemblance of this plant to our Common Milkweed, (*Asclepias tuberosa.*) It is probable that it is of the same class and order, viz.: *Gynandria, pentagynia;* but the species, and even the genus, is undoubtedly different. The *Asclepias* grows abundantly in our fields, and seems most to affect light and arid soils. The Silk Plant would be likely to flourish in the same situations, though it is doubtful if the climate of our Northern, or even Middle States would be sufficiently congenial to it, to make its culture there an object worthy of attention. We should be glad to see the experiment fairly tried in the Southern portions of our country.

GREAT SALE OF CATTLE AT ALBANY.—We are glad, on every account, to learn, by the following from the New-York Express, that Mr. Prentice's great sale of Short-Horns was well attended. From Mr. Allen, of the American Agriculturist, who was in attendance, and who has done much to spread a knowledge of the fine properties of the Short-Horns, we shall doubtless have a more particular account of the sale. We hope this measure on the part of Mr. Prentice does not indicate the withdrawal of the liberal countenance he has given to one of the most important branches of Agricultural economy:

"The entire herd of Short-Horned Cattle of E. P. Prentice, Esq., of Albany, was sold in that city on the 25th inst. The cows were sold from $225 to $100; heifers in proportion. There was a great deal of interest attending the sale, which shows that the spirit for Agriculture is wide awake in this State."

Since writing the above, we have received the following, from a correspondent in Albany. It will be seen that the cows averaged nearly $150. It is to be hoped that those into whose hands this fine stock has fallen will keep them in a manner that shall do justice to their breed and breeder:

CITIZEN OFFICE, Albany, June 25.

The interest excited by the sale of the entire herd of improved Short-Horned Cattle of E. P. Prentice, Esq., of this city, brought a host of visiters to the sale.

Annexed is a summary of the sales with the names of the purchasers, made up from the catalogue of the auctioneers, Joshua I. Jones & Parke.

Names.	*Purchasers.*	*Residence.*	*Price.*
Flora, cow, imp.	J. B. Nott	Albany Co.	$150
Caty, heifer	W. S. Parker	Brooklyn	100
Calf of Flora	"	"	40
Miss Rose, cow	J. S. Wheeler	Hyde Park	140
Roan heifer	Wm. Kelly	Rhinebeck	70
Catharine, cow	M. Bates	New-York	105
Balize, bull calf	—— Green		55
Matilda, claimed by the owner.			
Snowball, cow	Smith	Long Island	100
Nun, cow	Wm. Kelly	Rhinebeck	110
Melissa, cow	W. S. Parker	Brooklyn	120
Caroline, cow, passed.			
Cora, cow	J. McNaughton	Albany	125
Meg, heifer	Wm. Kelly	Rhinebeck	65
Tyro, bull calf	J. B. Nott	Albany	55
Daisy, cow	Dr. McNaughton	"	105
Nell, cow	M. Bates	New-York	225
Diana, cow	J. W. Bishop	Wash. Co.	155
Tecumseh, bull	J. Parker	Brooklyn	200
Betty, calf	Wm. Kelly	Rhinebeck	55
Swally, cow, claimed by owner.			
Calf of Dutchess			30
Rover, heifer	D. P. Douw	Albany	70
Charlotte, cow	J. W. Bishop	Wash. Co.	190
Calf of Fairfax	J. H. Prentice		55
Ada, cow	R. H. Green		170
Calf of Ada	W. S. Parker	Brooklyn	45
Juda, heifer	E. S. Prentice		250
Duke, allowed to owner.			
Appolonia, cow	J. P. Brayton	Albany	160
Louisa, cow	R. H. Green		150
Burley, heifer	V. P. Douw	Albany	80
Splendor, cow	W. J. Parker	Brooklyn	190
Peggy, cow	J. P. Brayton	Albany	200
Peggy 2d, calf	V. P. Douw	Albany	110
Ramble, heifer	W. J. Barker		75
Esterville, claimed by owner.			
Jenny, cow	E. H. Smith		105
Jilt, heifer	Wm. Kelly	Rhinebeck	60
Calf of Jenny	J. T. Walker	Ohio	25
Aurora, cow	J. B. Nott	Albany	145
Timour, bull calf	M. J. Hays	Canada	80
Calf of Aurora	J. T. Walker	Ohio	75½
Dora, not sold.			
Miss Smith, cow	P. W. Tuthill		80
Fairfax, bull	W. J. Parker		205

AGRICULTURAL REPORTS.

English Agricultural journals give general reports of weather and of crops, with the utmost confidence in their accuracy—as for instance in the last number received of the Mark-Lane Express, the editor pronounces the then growing crop of wheat to be the most promising throughout the kingdom within the recollection of the oldest inhabitant. How impracticable is it, for obvious reasons, to give such reports, with any thing like the same particularity in this country! Look at the difference in the size of the area, over which our diversified crops are growing. Virginia alone for instance, has an area, about one-third larger than England. The State of Ohio contains 8,000 square miles more than Scotland. From Augusta in Maine to New-Orleans is about 200 miles more than from London to Constantinople. We think, however, we may venture to state that the wheat crop of 1845 in the United States will prove to be more than an average one. The accounts from Maryland and Virginia are very favorable. A cool and dry Spring has usually been found favorable to that grain.—Most apprehension had been felt about the crops in Ohio, but Butcham's Cultivator of the 15th ult. says that recent showers had greatly improved the prospects for wheat and corn, so that the yield of wheat "may be as great, if not greater, than for several years past," and has no doubt the crop of corn will prove at least an average one. The crops of Ohio must have an important bearing on the general average of the country, seeing that her product in 1840, of

wheat, was 17,979,647 bushels, and Indian corn 35,552,161.

But what a sombre picture comes up to us from the South. We must hope it is overcharged. The Charleston Courier publishes the following extract from a letter, dated Fairfield District, 14th instant:

"Over my parched and naked fields drouth has reigned and does reign supreme. My once verdant fields of small grain have withered and died under the ravages of the chinch bug; my dwarfish and sickly corn is threatened with annihilation from the same cause; my pastures are ash-beds; my water courses sand-beds; and my cotton barely rears its puny head above the scorched earth. When employed at my business, devasted oat fields, blighted corn, and stinted cotton sicken my heart. When I stroll to uncultivated fields, famished hogs and staggering cattle are my comforters. Clouds pass over, thunder rolls, but all ends in mockery.—Hope has been deferred till I have lost all acquaintance with it. It would seem inevitable that I must not only fail to make my bread, but that the whole country around must share my fate.

A Rich Morsel for American Cheese Mongers.—From that truly national and deservedly popular periodical, *Hunt's Merchants' Magazine*, we derive the following interesting item:

American Cheese Exported into Great Britain.

Years.	From Europe. Cwts.	From America. Cwts.	Total. Cwts.
1841,	254,995	15,154	270,149
1842,	165,614	14,098	179,712
1843,	136,998	42,312	179,310
1844,	160,654	53,115	213,769

The Liverpool Times says: "To our American friends, we say, send to this country nothing but a good article, introduce more color into it, and we are sure that in another year England will use four times the quantity of its previous consumption. We shall also be pleased to find that the manufacturer and exporter get a larger share of the prices for which it is sold in England. The writer of this has now upon his table an American Cheese equal to the celebrated 'Stilton,' for which 25 cents per pound is obtained, while this excellent 'American' is sold at 13 cents, only."

PRICES CURRENT.

[*Corrected for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort	℔ 100 lb.	3 87½	@— —
Pearls, 1st sort		4 25	@— —
BEESWAX—American Yellow		— 29½	@— 30
CANDLES—Mould, Tallow	℔ lb.	— 9	@— 11
Sperm, Eastern and City		— 27	@— 29
COTTON—From		— 5	@— 9½
COTTON BAGGING—American		— 14	@— —
CORDAGE—American	@ lb.	— 11	@— 12
DOMESTIC GOODS—Shirtings	℔ y.	— 5	@— 11
Sheetings		— 6½	@— 12½
FEATHERS—American, live		— 26	@— 30
FLAX—American		— 6½	@— 7
FLOUR & MEAL—Genesee	℔ bbl.	4 62½	@— —
Troy		4 56½	@— —
Michigan		4 50	@ 4 56½
Ohio, flat hoop		4 50	@ 4 56½
Ohio, Haywood & Venice		5 37½	@ 5 50
Ohio, via New-Orleans		4 25	@ 4 37½
Pennsylvania		4 75	@ 4 87½
Brandywine		4 87½	@— —
Georgetown		4 75	@ 4 87½
Baltimore City Mills		4 75	@— —
Richmond City Mills		6 —	@ 6 50
Richmond Country		4 75	@— —
Alexandria, Petersburg, &c		4 75	@— —
Rye Flour		3 —	@ 3 25
Corn Meal, Jersey and Brand		2 31½	@ 2 56½
Corn Meal, Brandywine	hhd,	11 75	@— —
GRAIN—Wheat, Western	℔ bush.	— 95	@ 1 06
Wheat, Southern		— 95	@ 1 —
Rye, Northern		— 64	@— —
Corn, Jersey and North	(meas.)	— 47	@— 48
Corn Southern	(measure)	— 44	@— —
Corn, Southern	(weight)	— 45	@— 46
Barley, Western		— 50	@— 52
Oats, Northern		— 38	@— 40
Oats Southern		— 32	@— 33
HAY—North River	bales	— 45	@— 62½
HEMP—American, dew rotted	ton	85 —	@95 —
" " water rotted		120 —	@182 50
HOPS—1st sort, 1845		— 12½	@— 15
IRON—American Pig, No. 1		35 —	@37 50
" Common		32 50	@35 —
LIME—Thomaston	℔ bbl.	— 85	@— 90
LUMBER—Boards, N.R.	℔ M. ft. clr.	30 —	@35 —
Boards, Eastern Pine		10 —	@11 —
Boards, Albany Pine	℔ pce.	— 7	@— 17
Plank, Georgia Pine	℔ M. ft.	33 —	@35 —
Heading, White Oak	℔ M.	— —	@45 —
Staves, White Oak, pipe		50 —	@— —
Staves, White Oak, hhd		40 —	@— —
Staves, White Oak, bbl		30 —	@— —
Staves, Red Oak, hhd		25 —	@26 —
Hoops		25 —	@30 —
Scantling, Pine, Eastern		14 —	@16 —
Scantling, Oak		30 —	@35 —
Timber, Oak	℔ cubic foot	— 25	@— 37
Timber, White Pine		— 18	@— 25
Timber, Georgia Yellow Pine		— 35	@— 40
Shingles, 18 in	℔ bunch	1 50	@ 2 —
Shingles, Cedar, 3 feet, 1st quality		22 —	@24 —
Shingles, Cedar, 3 feet, 2d quality		20 —	@22 —
Shingles, Cedar, 2 feet, 1st quality		— —	@17 50
Shingles, Cedar, 2 feet, 2d quality		15 —	@16 —
Shingles, Cypress, 2 feet		11 —	@13 —
Shingles, Company		— —	@30 —
MUSTARD—American		— 16	@— 31
NAILS—Wrought, 6d to 20d		— 10	@— 12½
Cut, 4d to 40d		— 4½	@— 4¾
PLASTER PARIS	℔ ton	— —	@ 3 —
PROVISIONS—Beef, M., new	℔ bbl.	8 75	@ 9 —
Beef, Prime, new		5 75	@ 6 —
Pork, Mess, Ohio, old and new		12 75	@13 —
Pork, Prime, Ohio, old and new		9 75	@10 50
Lard, Ohio	℔ lb.	— 7½	@— 8½
Hams, Pickled		— 6½	@— 6¾
Shoulders, Pickled		— 4½	@— 4¾
Sides, Pickled		— 6	@— 6½
Beef Hams, in Pickle	℔ bbl.	12 —	@12 50
Beef, Smoked	℔ lb.	— 8	@— 8½
Butter, Orange County		— 14	@— 16
Butter, Western Dairy		— 11	@— 13
Butter, ordinary		— 10	@— —
Cheese, in casks and boxes		— 6	@— 7
SEEDS—Clover	℔ lb.	— 6	@— 7
Timothy	℔ tierce	9 50	@12 —
Flax, Rough		8 50	@ 8 75
Flax, Clean		— —	@— —
SOAP—N. York, Brown	℔ lb.	— 3½	@— 5½
TALLOW—American, Rendered		— 7	@— 7½
TOBACCO—Virginia	@ lb.	— 2¾	@— 5½
North Carolina		— 2¾	@— 5
Kentucky and Missouri		— 2¾	@— 5½
WOOL—Ame. Saxony, Fleece	℔ lb.	— 36	@— 38
American, Full Blood Merino		— 32	@— 34
American ½ and ¾ Merino		— 27	&— 28
American Native and ¼ Merino		— 24	@— 26
Superfine, Pulled		— 31	@— 32

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LADY SUFFOLK.

A DISSERTATION ON HORSE BREEDING, AND ON THE TROTTING HORSE OF THE U. STATES.

Ah! What is this we have here? says the staid and sober farmer, as, on coming in from his daily round, he puts aside his sombrero, and takes up the FARMERS' LIBRARY, to beguile the time, while the thrifty housewife is spreading his frugal repast. What do I see? *Lady Suffolk!* the cynosure of all observers; the very pink and *Fashion* of the day on every Trotting Theatre! And is it then a part of the design of a work which is offered for our instruction and amusement, to encourage and illustrate such diversions? No! good reader, not at all! There is, says the good book itself, a time for all things, as there is a place for all things; and *the* place for all field amusements, in our country, is the "SPIRIT OF THE TIMES." Far from wishing to poach on the manor of our friend Porter much rather would we assist in stocking it with choice game—but who besides Neptune can wield his own Trident! Who but himself, wear the armor of Achilles! and besides, as we well remember, he did once come very near taking the wind out of our sails, whereupon we surrendered to his management and direction, the whole field of rural sports, and have ever since most heartily wished that his success might only equal his *spirit*,—may he never be at a loss for the where, and the wherewithal, to wet his line and his—whistle; and may he never throw fly, without hooking a trout.

No, gentle, sedate, and courteous reader; we have been at some trouble and expense to procure and offer you a portraiture of Lady Suffolk, for the sake of presenting to the eye of the practical farmer, as well as the amateur of horse flesh, who may or may not be horse breeders, the true form and points, as nearly as the arts at our command would enable us; of an animal the most distinguished in that form of action, *the trot*, which of all equestrian paces deserves to be regarded as the *most useful* in the business of life; unless it be, what he "of Roanoke" denominated, the "long slouching walk of the blood horse in the plow."

Although, as may be seen in our edition of "YOUATT AND SKINNER ON THE HORSE," published by Lea & Blanchard of Philadelphia, we had given accounts of many of Lady Suffolk's most distinguished feats, we had never had the pleasure to see her until to-day, nor, that we remember, had we inquired particularly, certainly not successfully, into her genealogy. But seeing how she had gone, both the pace and the distance, we never doubted, that whenever it should be traced, it would be found to be of high aristocratic blood. Hence, when we came now, as in duty bound, to look into her lineage, it occasioned not the least surprise to find it tracing through more than one stream, directly to the fountain of so much that is superexcellent in *horseology*—to wit: to the loins of *old Messenger himself!* In truth, when we reflected on her birthplace—Long-Island—and came to see her veins so well defined—her apparently hard bone—her large, open jaws—prodigious muscular development, and yet more, her grey color, and the way she carries her age, we should have been disappointed not to find at her heart something of the same strain of blood that conferred similar power on her near relatives, *Mambrino* and *Abdalla*—son and grandson of Messenger—*trotters and the getters of trotters.*

According to the best information we have been able to get, Lady Suffolk was by ENGINEER, a grey horse, he out of a mare whose

pedigree is not remembered, but "was understood to be a blooded mare"—Engineer was by Engineer, said to be an uncommonly fine horse, and by *Messenger*. Lady Suffolk's dam, was a dark bay or brown mare, by *Don Quixote*, a grey horse, and he again by Messenger. Lady Suffolk was bought (when four years old, and when she was yet barefooted and hardly bridle-wise, having never then looked through a collar) by David Bryan, Esq, of Brooklyn, her present owner—who, "though laughed at by some, *thought he saw something about her that pleased him.*" She made her first appearance about 14 months after he bought her, on the Beacon Course. She has trotted many more than fifty matches, appearing at different times at Baltimore, Philadelphia, New-York and Boston; winning much oftener than she has lost, and making the quickest time on record: doing her mile on three different occasions, under the saddle, in 2m. 26½s. On the Centreville Course, she trotted one mile, in a two mile match, in 2m. 30s., in harness. She was beaten but once last season, and only once again this season. and that only by a neck. At Hyde Park, Philadelphia, she trotted matched in harness along-side of Ripley, two miles in 5 minutes 19 seconds, distancing Hardware and Apology.

Her owner has taken no measures to test, accurately, the time in which she *can* go her mile, under the saddle; but would gladly match her for any reasonable amount, against her greatest, and the quickest time on record—2m. 26½s. He thinks, and we do not doubt, that Lady Suffolk is still, like the whole world, *in a state of progress*, and has not yet reached her highest point of capability.

Like all well-bred dames, she is remarkably quiet and gentle; nothing fussy, impatient, or ill-tempered about her. Any old woman might drive her to market, where she might remain in a wagon unnoticed, except by a man who *had an eye for a good thing.*

It is worthy of note, to show how accident rules the destiny of horses as well as men; that her sire was for a long time neglected, being put off, for the most part, with ordinary, unsightly mares, and the way that he was at last reclaimed, and brought into full relief, was thus: Doctor Bowers, being often sent for, as country physicians are, on certain pressing emergencies, that won't stay for any man's convenience, to go in a great hurry, especially to his female patients, several times observed that the messengers sent for him, rode horses of uncommon power and action; and inquiring into their history, was uniformly answered that they were by *Engineer*; a horse with which he had been familiar, and that had been denied the tip top mares where he stood, so that his owner had sold him off to distant parts, in disgust, at his being underrated. On seeing thus the marks he had left behind, the Doctor had the sagacity to go or send in search of him, and tracing him through Connecticut and Rhode-Island, found him stowed away in some odd corner in Massachusetts; and for a trifle recovered him and brought him back again, to enjoy better opportunities of transmitting his superior qualities, such as are embodied in Lady Suffolk, and a half sister, standing now in the next stall to her, at Brooklyn—a flea-bitten grey mare, of the same age, who, though badly spavined, moves with great speed and power, and exhibits, in like manner, the remarkable points that distinguish the Messenger stock; such as may be, even down to the present generation, at once detected by quick-sighted connoisseurs of good cattle.

$5,000 have been repeatedly refused for Lady Suffolk, and the probability is, that like other distinguished performers, she may go to act in Europe on a theatre, larger, and more remunerating than is to be found in this Democracy.

The point that impressed us most forcibly, at the first glance, as most striking in the *physique* of Lady Suffolk was, as before stated, her wonderful muscular display, over the shoulder and arm—thigh and leg proper—her strong loin and good share of bone,—all indicating great strength.

Professor Cline, of London, one of the most esteemed writers on the art of breeding, and on the form of animals, remarks, that "muscles and tendons, which are their appendages, should be large; by which an animal is enabled to travel with greater facility." "The strength of an animal," he adds, "does not depend on the size of the bones, but on that of the muscles; many animals with large bones are weak, their *muscles being small.*"

In our country we are well satisfied, and it is probably true as to others, the improvement of domestic animals, has been much retarded, by the vulgar persuasion, that the *largest males* should be selected, for the purpose of procreation; a most pernicious error! This fallacy is the source of the mortification experienced by many farmers, who select from their herd or their flock, or in purchasing give the largest price for overgrown bulls and rams, without respect to form or family, or excellence in particular points; and too often give the preference to stallions blazoned in their handbills, for being "full sixteen hands and upwards under the standard." It was not thus that the Collingses improved the short horns, or Ellman the Southdowns, or that the general stock of English horses, has been brought to its admitted excellence. This has been accomplished by successive, and in most cases judicious crosses, having frequent recourse, when building up their pre-

sent superior stock, to foreign crosses. Most frequently to *Barbs*, (as the Godolphin.) which is known to be a race of comparatively small horses, with thin skin, fine hard bone, and a great share of muscle.

Many are at a loss to account for the fact, that English horses have not been benefited by recent crosses with Arabian stallions, but to us it seems apparent, that the reason why the *Darley Arabian*, and after him the yet more celebrated *Barb*, Godolphin, contributed more decidedly than any Arabians have done since, to the improvement of their stock, is, that they were imported at the very juncture when the English stock was in a condition to need a cross, that should impart more muscle and harder bone, with better wind; while it should diminish the size and weight of the carcass, which had been made too heavy and inert, by repeated recourse to *Flemish and German blood*. On this point Professor Cline is quite explicit: "the great improvement of the breed of horses in England, arose from crossing with those *diminutive* stallions, Barbs and Arabians; and the introduction of Flanders Mares into this country was the source of improvement in the breed of cart horses: when it became the fashion in London to drive large bay horses, the farmers in Yorkshire put their mares to much larger stallions than usual, and thus did infinite mischief to their breed, by producing a race of small chested, long-legged, large-boned, worthless animals."

The ill effects here described by the distinguished Professor, was the result in our own country, of a large "Cleveland bay" stallion, imported by the late Robert Pattison of Maryland, and sent into Frederick county of that State. His younger brother, a gentleman of fortune by inheritance, but a farmer by choice, and of uncommon sagacity and judgment, would have foreseen the result of such a cross. Nowhere so systematically as on his estate, have we ever seen so fully carried out and completely illustrated, this important principle in breeding as already quoted from Professor Cline, that "to produce the most perfect formed animal, abundant nourishment is necessary from the earliest period of its existence until its growth is complete." So thoroughly is Mr. P. impressed, too, with the expediency of getting *as much blood* as you can into the horse of all work, consistently with the weight which is indispensable for slow and heavy draught, that he seeks to have as much of it as can be thrown into his *plow and wagon horses*. Were the question doubtful, the argument must preponderate which is supported by the practice and experience of an agriculturist, rare in all countries, who is ready with his reason for every thing he does, and "no mistake at that."

Having accomplished their purposes by enlarging the lungs, and improving the conformation of their species, giving more muscle in proportion to the mass of flesh to be carried, the same stallions, from Arabia and Barbary, could they rise Phœnix-like from their ashes, could, probably, not now be employed with the same beneficial effect in England.

English writers, and among them Mr. Aperly, (Nimrod,) one of the most voluminous and accomplished, on field sports, admits the superiority of the American *Trotter*, and as that is perhaps the only sort of animal, or department, in which we can lay claim to excellence over John Bull, in any of the properties which give value to domestic animals; and as, moreover, *speed in that gait, combined with lastingness*, is a desideratum in horses destined as well for public and private coaches, as for all kinds of light harness, and quick traveling, it becomes an interesting inquiry, both to amateurs of the Horse, and to practical farmers,—*whence has resulted the superiority asserted for, and conceded to the American Trotting Horse?* Is it that we possess a particular strain of horses not to be found in other countries, not *thorough-bred*, but yet of a specific breed, which has been found or made in America, and which may be kept separate and distinct from all others, the root whereof is not necessarily to be looked for, like that of our thorough-bred stock, in the *English Stud-Book*, or in the blood of some Eastern ancestor—a breed to which, in a word, recourse may be had as a stock of horses *sui generis*, and one that may be relied upon to supply fast goers in this pace? Or is it that we owe the number that can go their mile under 2.40, to the higher estimate which is placed on excellence in that way, in this country; and to the greater pains taken and skill exercised in educating and training horses to go ahead in the trot? We confess that reflection and all the lights we possess, lead us to the adoption of this latter theory.

There are various reasons why this property in the horse should be more attended to in this, than perhaps any other country. May it not be referred in some measure, to our political institutions, as we have already seen, in the view which has been taken [in Skinner and Youatt on the horse] of the progressive improvement of horses in England, how their qualities have, from time to time, been influenced and modified by their field-sports, the state of their roads, the form of their coaches, and changes in their warlike and agricultural habits and implements? Under the effect of our political institutions, which create frequent division of estates, it is next to impossible that there should exist in America a *class* of men with sufficient and enduring wealth, either hereditary or acquired, to maintain the costly and magnificent arrange-

ments for the sports of the turf and the chase—such as have for centuries existed in England. Yet men must have amusements, and those which are found a-field are at once the most attractive and salutary.

It may be very safely affirmed, that while there can exist in this country no permanent class of men possessing the wealth which affords the time, and cherishes the taste, for the more expensive diversions of the Turf and the Chase; it must yet always abound far beyond all other countries, under their existing governments, in citizens of middling and yet easy circumstances, with means enough to indulge in other sports involving *moderate outlay*, including the ownership of a good old squirrel gun; and the luxury of a *good horse*; and hence the use of both is as familiar to the great mass of American people, from their childhood, as it is strange to the common people of any other country; except as to the employment of the horse, in his lowest offices of field-labor and common drudgery. No Southern boy, at least, just entering his teens, desires better fun than to be allowed to catch and mount any horse in the most distant pasture, and ride him home at the top of his speed, without saddle or bridle—and as to the use of fire-arms, it was remarked to the writer during the Late War with England, both by General Ross and Admiral Cockburn, that in no country had they ever witnessed any fire so deadly as that of the American militia, *as long as they would stand!* In the towns, there is not a sober and industrious tradesman who cannot manage to keep his hackney; and these considerations sufficiently account for the number of regularly constituted Trotting Clubs of easy access, with courses that serve as so many nurseries, where the horse is educated exclusively for *the trot*, and his highest physical capacities drawn out in that form. These associations are composed, for the most part, of respectable and independent mechanics, and others, especially *victualers*, among whom in all times there has existed a sort of *esprit de corps*, or monomania on this subject, which leads them to spare neither pains nor expense to gain a reputation for owning a crack goer. This sort of emulation so infects the class, as to have given rise to a common saying that "*a butcher always rides a 'trotter.*"

According to the theory here maintained, the great *number* of trotters in America that can go as before said, their mile under 3 minutes, and the many that do it under 2m. 40s., and even in some cases under 2m. 30s.—as, for instance, in the case of Ripton and Confidence, whose performances have given so much gratification to sportsmen, is to be explained in the same way that we account for the *great number of superb hunters* that are admitted to abound in England above all countries, not excepting our own.—There, in every county in the Kingdom, there are organized "*Hunts,*" with their whippers-in, and huntsmen, and earth-stoppers, and costly appointments of every kind to accommodate some fifty or a hundred couple of high-bred hounds, whose pedigrees are as well preserved as those of Priam or Longwaist; and a wide district of country is reserved and assigned exclusively to each hunt. Fox-hunting is there termed, *par excellence*, a princely amusement; and gentlemen of the most exalted rank and largest fortune take pride in the office of "*Master of the hounds;*" and assuredly, in all the wide field of manly exercises, none can compare with an English fox or steeple-chase, for union of athletic vigor and daring skill, and magnificence of equitation; unless, perhaps, it were some splendid *charge de cavalrie*, like those we used to read of, made by the gallant MURAT at a critical moment of the battle, when he was wont, in his gorgeous uniform and towering plumes, to fall with his cavalry like an avalanche upon his adversary, confounding and crushing him at a blow! Truly, it would well be worth a trip across the Atlantic, to see a single "turn out" of an English hunt, all in their fair tops, buckskin smalls, and scarlet coats—mounted on hunters that under Tattersall's hammer would command from one to two hundred guineas! Imagine such a field, with thirty couple of staunch hounds, heads up and sterns down, all in full cry, and well away with their fox!!

> "Now, my brave youths,
> Flourish the whip, nor spare the galling spur;
> But, in the madness of delight, forget
> Your fears. Far o'er the rocky hills we range,
> And dangerous our course; but in the brave
> True courage never fails."

To indicate more strongly the prevalence of this partiality for trotting-horses, and emulation to own the fastest goer, and the number and extent of associations and arrangements for this sort of trial and amusement, it need only be mentioned that the "New-York Spirit of the Times" contains lists of hundreds of matches and purses, and of thousands on thousands of dollars in small purses, won and lost on these performances on *trotting-courses!* A number of these performances might be given, enough to show that the excellence which is conceded to American trotters is not founded on a solitary achievement or very rare cases, nor to be ascribed to the possession of any distinct and peculiar breed of horses; but is the natural and common fruit of that union of blood and bone, which forms proverbially the *desideratum* in a good hunter, and of which Lady Suffolk presents a remarkable specimen, with the superaddition of *skillful training, much practice*, and *artful jockeying* for the trotting course. Who can doubt that if Hiram Woodruff were to go

to England, having the run of their hunting-stables, he might select nags enough which could soon be made, under his training and consummate jockeyship, to go along with Edwin Forrest and Lady Suffolk, Ripton, Rattler, Americus, and the Dutchman? On this point the following may be aptly extracted from the highest authority—*our* Bell's Life in London—to wit: Porter's Spirit of the Times:

"Nimrod, in 'admitting the superiority of our Trotting-Horses to the English,' claims that the English approach *very near* to the Americans,' even in this breed of cattle. But there is no comparison whatever between the Trotting-Horses of the two countries. Mr. Wheelan, who took *Rattler* to England last season, and doubly distanced with ease every horse that ventured to start against him, as *the record* shows, informs us that there are twenty or more roadsters in common use in this city, that could compete successfully with the fastest trotters on the English Turf. They neither understand the art of training, driving or riding, there. For example: some few years since, *Alexander* was purchased by Messrs. C. & B. of this city, for a friend or acquaintance in England. Alexander was a well-known roadster here, and was purchased to order, at a low rate. The horse was sent out and trials made of him; but so unsuccessful were they, that the English importers considered him an imposition. Thus the matter stood for a year or more. When Wheelan arrived in England, he recognised the horse, and learned the particulars of his purchase and subsequent trials there. By his advice the horse was nominated in a Stake at Manchester (we believe) with four or five of the best trotters in England, he (Wheelan) engaging to train and ride him. When the horses came upon the ground, the odds were 4 and 5 to 1 against Alexander, who won by nearly a *quarter of a mile!* Wheelan says he took the track at starting, and widened the gap at his ease—that near the finish, being surprised that no horse was anywhere near him, as his own had not yet made a stroke, he got frightened, thinking some one might outbrush him—that he put Alexander up to his work, and finally won by an immense way—no horse, literally, getting to the head of the quarter stretch, as he came out at the winning stand! The importers of Alexander, at any rate, were so surprised and delighted at his performance, that they presented Wheelan with a magnificent gold timing-watch, and other valuable presents, and sent Messrs. C. & B. a superb service of plate, which may be seen at any time at their establishment in Maiden-Lane."

Here it is clearly shown that the comparative speed of American horses is to be attributed not to *breed*, but to *management*, on which we the rather insist, as it is to be desired that American agriculturists, and all breeders and trainers of horses, should understand and practice upon some fixed and rational principles, rather than rely for success on some imaginary strain of horses, of no certain origin or established blood. After all, we have accounts of performances in trotting, by English horses, that may be considered as extraordinary as those of our own, when allowance is made for the greater value placed, and the more attention and skill bestowed, upon trotters in this country than in that.

The celebrated English trotter Archer, descended from old Shields, a remarkably strong horse and master of fifteen stone, (two hundred and ten pounds,) trotted his sixteen miles, in a very severe frost, in less than fifty-five minutes. In 1791, a brown mare trotted in England, on the Essex road, sixteen miles in fifty-eight minutes and some seconds, being then 18 years old; and, while we are writing, we learn from an official report that Lady Hampton, on the 2d of May, 1842, in England, trotted seventeen miles in 58m. 37s. in harness. She was driven by Burke, of great English trotting celebrity. On the 13th of October, 1799, a trotting match was decided over Sunbury Common between Mr. Dixon's brown gelding and Mr. Bishop's grey gelding, carrying twelve stone (one hundred and sixty-eight pounds) each, which was won by the former in twenty-seven minutes and ten seconds. A Mr. Stevens made a bet which was decided 5th October, 1796, that he would produce a pair of horses, his own property, that should trot in tandem from Windsor to Hampton Court, a distance of sixteen miles, within the hour; notwithstanding the cross country road, and great number of turnings, they performed it with ease in fifty-seven minutes and thirteen seconds. Phenomena trotted nineteen miles in an hour.—These examples are adduced to show the fallacy of that impression which would lead the public to look to any but the true and rational sources of superiority—for mankind has ever been prone to the marvelous, preferring to look for all that does not lie on the surface, to some mysterious influence, unconnected with known and rational causes. The trotter, according to the distance prescribed as the measure of his capacity, needs the combination of form and blood—of bone and of muscle, which give distinction to the hunter; and the reason, if it be asked, why the *thorough-bred* cannot be relied upon for a hard run over a rough country, is, that he rarely *combines* these requisites, and is, moreover, put to his work when *too young*; but does any one doubt that Sir Archy, or Timoleon, or Eclipse, or imported Tranby, or Leviathan, would have made first-rate *hunters* or *trotters*, if, before they were put to hard work, their frames had been left to ripen, and their bones and joints and muscles to get firm and solid, and at the same time pliant and supple, by gentle and moderately increasing exercise until five or six years old—for here it is to be noted that, as to the *age at which the trotter should be put in training*, and that at which he reaches his maximum of power, though there would seem to be some difference of opinion, all agree that the trotter is not in his prime

until he is eight or nine years old. The Abdallahs, great-grandsons of old Messenger, trot much younger; Hiram Woodruff—and there can be no better authority—would *commence* a horse's training for the trot at five or six years of age, giving him light work, however, but going on increasing his work from year to year, and expecting increasing excellence up to nine or ten years, and with kind usage he might continue up to this mark for three or four years longer, and they often last to perform admirably until after twenty—for example: *Columbus, Paul Pry, Topgallant*, &c.

The stoutest horses, of whatever kind or degree of blood, might be expected to give way if put at three or four, as the race-horse is, into severe training under heavy weights, for trotting-stakes or the chase; but on the other hand, without blood to give him wind and courage, what would avail his "bag of bones," in a trial to trot his hundred miles in ten hours? Johnson, author of the Sportsman's Cyclopedia—justly esteemed high authority on such subjects—remarks that "thorough-bred horses, and particularly those of the best blood, are seldom possessed of sufficient bone to render them pre-eminently calculated for the chase; yet I am free to confess that the very best hunters that have fallen under my observation have been *remarkably well and very highly bred*, but yet not absolutely thorough-bred." The same remark, it is not doubted, might be made as generally applicable to our first-rate trotters, at long distances. The case of Abdallah and Messenger has been instanced to show that great trotters, not thorough-bred, may and do *beget* trotters; and hence some would argue that a distinct race of horses may or does exist. But it is to be remembered that both Abdallah and Messenger are sons of Mambrino, son of old Messenger, and of Messenger mares, though not thorough-bred; and nothing is better known by all who have been in the habit of attending to these subjects, than that the Messenger family is distinguished for making first-rate coach-horses—quick in light harness, and remarkable for endurance and long life. That Abdallah, therefore, himself deep in the Messenger blood, should be himself a trotter and a getter of trotters, only proves that like begets like; and that of a distinct breed, like the thorough-bred horse, characterized by the possession of general properties belonging only to and constituting that breed, there may be *particular families* distinguished for some peculiar qualities not possessed in the same degree by other families of the same breed. Thus we have the three classes of the English thorough-bred stock, to wit: the *Herod*, the *Matchem*, and the *Eclipse*, that have served as crosses for each other. In like manner, it may be said of the improved short-horn cattle—their general characteristic is early maturity and propensity to fat, without being generally remarkable as deep milkers, though there are *families* of the short-horns esteemed for *that* quality. A dash of the blood of old Messenger imparts high form and action for the State coach, and the eye of the connoisseur can detect the signs in a horse in whose veins flow even one-eighth of his blood; so the fact is generally known to old gentlemen in the South, and especially avouched by the Sporting and Agricultural Society in South Carolina, that the stock of old Janus (there called Genius) was so remarkable as *road and saddle horses*, as to have gotten to be considered a distinct breed; so the Topgallant stock made fine saddle-horses, excelling in the canter. The blood horse, too, is remarkable for longevity—the Messenger stock particularly so. If the truth could be known, it is probable it flowed in larger or smaller streams in each of the four thorough-breds which the late General Hampton (sire of that paragon of sportsmen and gentlemen, Col. Wade Hampton) drove in his coach all together for sixteen years.

While it has been found impracticable to obtain any precise information as to the pedigree of some of our very best trotters, in other cases where more is known, they are found to be deep in the blood.—Awful, whose performances will be seen in the tables annexed, is known to have been gotten by a thorough-bred "American boy." Abdallah, as before mentioned, is by Mambrino, and he again, a great trotter, by Messenger; but *Dutchman*, one of our best trotters, has no known pedigree, though we have some reason to think he was by Young Oscar, then at Carlisle. He was taken out of a clay-yard, and was transferred to the trotting-turf from a Pennsylvania wagon-team. Woodruff thinks blood does not give them *length*, or the power to go the long distances; but in this it is believed he must be mistaken. These Canadian or Norman-French stallions, small and compact, which on well-formed, large mares give such fine harness-horses and trotters, are, as before said, deeply imbued with the blood of the barb taken from Spain into Normandy. We have been told lately by an intelligent Englishman, that the infusion of blood into their coach-horses has enabled them to lengthen their stages, and in very observable proportion to the degree of blood. Finally, as where the blood of the trotter when known, is seen to flow in so many instances from a spring of pure blood, is it not fair to infer a *similar* origin in cases where the blood cannot be traced? especially as the universal experience of all times proves that in other paces, the cases have been *extremely rare*, in which a horse of impure blood has been known to *keep up a great flight of speed?* A

horse of *mixed* blood may be a great trotter at a long distance, because his speed at his best is greatly behind that of the best speed on the turf; but it would, according to all principles of reasoning, be unreasonable to expect great excellence even as a trotter, in horses *altogether free* from the blood which gives foot and wind to the Eastern courser. Though we may not be able to trace it, and though in solitary cases a horse without it, may possess great speed and lastingness in the trot, from excellent accidental conformation, we repeat that the possession of the two warrants the presumption of the third, however obscure the traces, or remote the origin;—*this is our theory!* But the action to be cultivated in the racer and the trotter is of itself sufficient to explain why a racer should not succeed at once on the turf and on the trotting-course. All reflecting and observant men will admit that "as there is no royal way to mathematics," so there is but one way for a horse to excel in his business; and with rare exceptions there is but one in which any individual horse can excel. Whatever that business may be. to be perfect in it he should be educated and kept to it—and to it only. *A trotting horse should do nothing but trot.*

The weight carried on the Northern Courses, where a majority of our trotting takes place, is 145 pounds, without any distinction for age or sex; and the same weight has to be carried by the driver, exclusive of the weights of his sulkey or match cart, as by the same jockey in the saddle. These match-carts are of the neatest construction, and weigh generally nearly ninety pounds, though they often weigh twenty pounds less, and there are one or two which weigh but fifty-three pounds! But the mere weight to be carried or drawn by a *trotter*, is much less regarded by the sportsman than in the case of the *race horse*. On the Hunting Park Course, near Philadelphia, the weight was formerly 147 pounds in the saddle, and in harness catch-weights, but they have now adopted the New-York scale. But in far the greater number of the cases below, unless the weight be expressly named, it may be presumed to be from 145 to 155 pounds. Hiram Woodruff weighs without his saddle 160 pounds. On the Beacon and Centreville Courses, pacers are allowed five pounds, and wagons, in distinction from sulkeys or match-carts, must weigh 250 pounds.

As a matter of course from the difference of weights carried along by him, the trotter generally makes better time under the saddle than in harness, though there are some exceptions to this rule. Another consideration has great influence upon this difference in time. Under the saddle, the jockey can hug the pole of our oval-shaped courses more closely than in harness, and thus he actually goes over less ground. And for an obvious reason the speed of a horse in going "round the turns" is more retarded in a sulkey than under the saddle. As before stated, no allowance of weights is made for age, and in consequence no note is taken of the age of trotters in official reports of their performances.

We have already intimated that in introducing Lady Suffolk to our readers, accompanied with this dissertation on *Trotting Horses*; our aim is, not to encourage a fondness for equestrian exhibitions of this character, merely as an amusement; but to indicate how excellence so desirable in this property of the horse, is only to be secured and cultivated, by attention to blood and good management of the breeding stud. With that object in view, and on the salutary principle of mixing the agreeable with the useful, it is deemed not amiss to entertain the reader, who may not have seen, or who may have forgotten them, with a few

MISCELLANEOUS EXAMPLES OF EXTRAORDINARY PERFORMANCES OF AMERICAN TROTTERS.

Topgallant, by Hambletonian, trotted in harness 12 miles in 38 minutes.—See Turf Register, vol. 1. p. 124.

Ten miles have been repeatedly trotted in America within two or three seconds of thirty minutes.

A roan mare called *Yankee Sal* trotted, as has been stated without contradiction, in a match against time, on the Course at Providence, R. I. which was at the time heavy and deep, fifteen miles and a half in 48m. 43s., a rate of speed so prodigious *under the circumstances*, that we have often suspected there may have been an error as to the time.

Lady Kate, a bay mare, 15 hands high, trotted on the Canton Course, near Baltimore, 16 miles in 56 m. 13s., and the reporter adds, "she could have done *seventeen with ease.*"

In October, 1831, *Jerry* performed 17 miles on the Centreville Course, L. I. in 58 minutes under the saddle.

In September, 1839, *Tom Thumb*, an American horse, was driven in England 16½ miles in 56m. 45s. We shall have more to say of this phenomenon, when we come to his performance of 100 miles.

In 1836, the grey gelding *Mount Holly* was backed at $1,000 to $500, to trot twenty miles within the hour. The attempt was made on the 10th of October, on the Hunting Park Course, Pa., but failed. He performed 17 miles in 53m. 18s. without the least distress. He was miserably jockeyed for the first five miles, doing no one of them in less than five minutes.

Pelham, a large bay gelding, in a match to go 16 miles within the hour, performed that distance without any training in 58m. 28s. He went in harness *seven* miles in 26m. 29s., when, the sulkey being badly constructed, he was taken out and saddled, and mounted by Wallace (riding 160lbs. without his saddle) and won his match.

Paul Pry, a bay gelding, was backed to perform 17¾ miles within the hour, under the saddle. On the 9th of November, 1833, on the Union Course, L. I., he won the match, performing 18 miles in 58m. 52s. Hiram Woodruff, weighing

then 138 lbs. jockeyed him. Paul Pry was nine years old, bred on Long Island, and got by Mount Holly, dam by Hambletonian.

In 1831, *Chancellor*, a grey gelding, ridden by a small boy, performed 32 miles on the Hunting Park Course, Pa., in 1 hour, 58m. 31s. The last mile, to save a bet, was trotted in 3m. 7s.

In October of the same year, George Woodruff drove *Whalebone*, on the same Course, the same distance in 1 hour, 58m. 5s. He commenced the match in a light sulkey, which broke down on the 14th mile, and was replaced by one much heavier. This Course is fifty feet more than a mile in the saddle track, and much more than that in the harness track.

On the 11th of September, 1839, Mr. McMann's bay mare, *Empress*, on the Beacon Course, in a match against time, $600 a side, performed in harness 33 miles in 1 hour, 58m. 55s.

The American horse *Rattler* was ridden by Mr. Osbaldistone in England, in a match against *Driver*, 34 miles in 2 hours, 18m. 56s.—Mr. Osbaldistone rode 125 lbs.; Rattler was 15½ hands high.

In July, 1835, *Black Joke* was driven in a match against time, on the Course at Providence, R. I., 50 miles in 3 hours, 57s.

A grey roadster is reported to have performed the same distance on the Hunting Park Course, Pa., in 3 hours, 40m. It was a private match.

A grey mare, *Mischief*, by Mount Holly, out of a Messenger mare, 8 years old, in July, 1837, performed *about* 84½ miles in 8 hours, 30m. in harness, on the road from Jersey City to Philadelphia. The owner would not allow a whip to be used. The day was excessively warm, and the mare lost her match (to perform 90 miles in 10 hours) through the stupidity of a groom who dashed a pail of water over her with a view of cooling her.

Tom Thumb, before mentioned, performed on 2d February, 1829, on Sunbury Common, England, 100 miles in 10 hours, 7m. in harness. He was driven by William Haggerty (weighing over 140 lbs.) in a match-cart weighing 108 lbs. This performance, so extraordinary, demands more than a passing notice, and we accordingly abridge from an English paper the following deacription:

"Tom Thumb was brought from beyond the Missouri, and is reported to have been an Indian pony, caught wild and tamed. Others again allowing him to have been thus domesticated, think him to have been not the full-bred wild horse of the Western prairies, but to have had some cross of higher and purer blood. But too little is known of his breeding, saving his Western origin, to justify any satisfactory speculation.

"His hight was 14½ hands, and his appearance, when standing still, rough and uncouth. From his birth, he had never been shorn of a hair. He was an animal of remarkable hardihood, a hearty feeder, and though accustomed to rough usage, was free from vice, playful and good-tempered. He was eleven years old when he performed his match, and had never had a day's illness. At full speed his action was particularly beautiful—he threw his fore-legs well out, and brought up his quarters in good style; he trotted square, though rather wide behind, and low. He was driven without a bearing rein, which is going out of use in England, and simply with a snaffle-bit and martingale. He pulled extremely hard—his head being, in consequence, well up and close to his neck, and his mouth wide open. He did his work with great ease to himself, and at 11 miles the hour, seemed to be only playing, while horses accompanying labored hard.

"The whole time allowed for refreshments during his great performance, amounted to but 37 minutes, including taking out and putting to the cart, taking off and putting on the harness, feeding, rubbing down and stalling. The day before and the day after the match, he walked full twenty miles. His jockey provided himself with a whip, but made no use of it in driving him; a slight kick on the hind-quarters was quite sufficient to increase his speed when necessary."

In February, 1828, *a pair* of horses trotted against time 100 miles on the Jamaica turnpike, on Long Island, and won in 11 hours, 54m.

CENTREVILLE, L. I.

TUESDAY, May 10, 1842.....Purse $300. Two-mile heats, in harness.

D. Bryan's gr. m. *Lady Suffolk*.....Owner 1 1
H. Woodruff's br. g. *Ripton*..... 2 2
Time, 5.10—5.15.

Wonders will never cease—the grey mare has proved the better horse, and no mistake.—No longer ago than last Saturday, Ripton popt it to the mare and Confidence, over the Beacon Course, in the quick time of 5.10½—5.12½.

On the present occasion, Ripton was the favorite at 100 to 70. At the start they went off well together, at the top of their rate, making play from the score: on reaching the first turn, Ripton broke, and the mare took the lead by several lengths, going finely. Hiram made several efforts to make up his loss, but all was of no avail; the mare kept snugly to her work, and led throughout the heat, making the quick time of 5.10.

Second Heat.—They both cooled off well, and came up ripe for mischief. They got off well together at a flight of speed; Ripton broke, as usual, on the first turn, and lost several lengths, the mare taking the lead. Hiram got Ripton snugly to his work again, and caught the mare in the last quarter of the first mile, both coming down the straight side at a tremendous flight of speed; on making the turn, Ripton broke, and lost about fifty yards; and before the mare got out, Hiram made up his lost ground, lapt the mare coming down the quarter stretch, but was unable to win the heat, for Hiram had taken the kink out of his horse to make up the lost ground. Ripton was very restless, and broke several times during each heat.

HUNTING PARK COURSE.

On Tuesday last, a splendid trot came off over the Hunting Park Course, two-mile heats, between Ripton and Lady Suffolk, in which they made the best time on record at this distance, in harness. Hiram Woodruff on Ripton won the last heat by six inches only!

Hiram Woodruff's br. g. *Ripton*.....Owner 1 2 1
David Bryan's gr. m. *Lady Suffolk*..... 2 1 2
Time, 5.07—5.15—5.17.

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The following table has been made with care. It will be seen that while, in this list of about thirty great performers, not one is over 16 hands, only two are under 15.

USUAL HIGHT OF TROTTING-HORSES.

The annexed list gives the hight of many celebrated horses, *estimated* only, but by two most

experienced men, one of whom had groomed or ridden almost every one named, and the other is an old amateur, who has the quickest eye for a horse, and who rode *after* most of those named, and has seen them all repeatedly. Of the twenty-nine in the list, they differed only about eight, and of these only by one inch, save in a single case. In the eight cases we have given the estimate of the jockey who had ridden or driven them, and have great faith in its accuracy.

Names.	hands.	inches.
Dutchman	15	3½
Lady Suffolk	15	2
Columbus	16	1
Aaron Burr	15	1
Rattler (the latest)	15	2
Screwdriver (old)	16	0
Do. (latest)	15	0
D. D. Tompkins	15	0
Lady Warrington	15	1
Lady Victory	15	2
Topgallant	15	3
Sir Peter	15	2
Whalebone	15	3
Shakspeare	15	2
Betsy Baker	15	3
Cato	16	0
Edwin Forrest	15	0
Burster	15	0
Norman Leslie	15	3
Confidence (latest)	15	2
Locomotive	16	0
Sally Miller	15	3
Charlotte Temple	15	0
Washington	16	0
Modesty	14	2
Greenwich Maid	15	0
Awful	15	3
Henry	15	1
Paul Pry	16	0

TRAINING AND JOCKEYING THE TROTTER.

The acknowledged superiority of the performances of the American over English trotters, or, to speak with more precise accuracy, extraordinary performances in a greater number of cases, has been already attributed to superior skill in *training;* but on that we must not be understood as laying so much stress as upon *superior jockeyship* in this particular department; for *the training of the trotting horse,* so far as we can learn, requires no considerable skill, save as it is connected with the skill of the jockey, who usually acts in both capacities.—For training, the whole code is said to consist of three words—air, exercise, and food. The work given him in training is severe according to his constitution, and consists in walking him from twelve to twenty miles daily, and giving him "sharp work" three or four times a week. This "sharp work" is usually a distance of two miles, or sometimes three. The horse is not put to his speed this entire distance, but taught to rouse himself at intervals, at the call of his jockey, who encourages him and brings out his utmost capacity by *his voice,* not less scarcely than by the usual persuasion of whip and spur. This feature of trotting jockeyship is peculiar, and not a little amusing. The jockey is continually talking, or rather growling, to his horse, and at times he bursts out into shouts and yells, that would be terrific if not so ludicrous. The object would appear to be twofold—first, to encourage his horse to the utmost possible exertion of his powers when called upon; and, again, so to accustom him to this harsh shouting, that he may not break up when he hears it from the opposing jockey—for it is deemed not unsportsmanlike for one jockey to break up the pace of another's nag by thus actually frightening him. Many a victory has Hiram Woodruff won by thus rousing his own horse and breaking up his opponent's on the last quarter. These two mile drives are not repeated as is usual in training the race-horse. Nor is the work of the trotter given at intervals so regular as in the case of the other, nor is he kept in such habitual quiet; the trainer consults his own convenience to a great degree as to the time when he will give his nag exercise, and he never hesitates about taking him out and showing him at any hour.

In other respects, too, the treatment of the trotting-horse differs from that of the more high-bred racer. Less delicate in constitution and form, he is less delicately fed and groomed.—Allowed to eat when and what they please, trotting-horses are groomed with much the same care as well-kept town coach-horses, or perhaps the English hunter. In the two grand points of keeping them in robust health and giving them hard work enough, the training of the trotter and the racer is identical. But, for the trotter, from six to eight weeks' training is deemed sufficient. We are inclined to believe that very much of the superiority of the American trotter and roadster is attributable to the skill of the jockey. Our mode of driving them differs essentially from the English; and, though neither easy nor elegant it succeeds admirably in developing the capabilities of a horse at this pace. The case already cited of Wheelan and the horse Alexander, in England, is in point, and it is practically illustrated every day in New-York, many English residents of which city are trotting amateurs; they, one and all, after a little experience, adopt the Yankee mode of driving.

It has long been a question exciting much interest, whether twenty miles has been, or can be, trotted in one hour. There is no record of any such performance, although there have been many attempts to do it. But men of great judgment and long experience are so fully confident of the ability of our horses to go that distance at the required rate, that large odds would be laid that it can be done. The difficulty is to find an individual who will, at this day, back him to an adequate amount; for it will readily occur that a horse that can accomplish the feat must be of great value, and the risk of injury to

him is, of course, very considerable. It is believed that $10,000 to $5,000 would readily be laid that Dutchman can do it, and probably Americus would be backed at less odds likewise to do it. The trotting amateurs in New-York profess to entertain no doubt at all upon the subject, and it is believed they have sufficient reason for the opinion.

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In making the presence of Lady Suffolk the occasion for this long disquisition on the trotting horse, whose powers we have illustrated by examples of extraordinary performance, we have been influenced, let us repeat, by all the considerations which the strictest utilitarian can be supposed to regard. We are convinced that whenever we shall have entirely lost sight of the wonderful capabilities which are only to be found in the *bred* horse, the inevitable consequence must be *general deterioration*; while, with proper inducements and precautions to measure his foot and to guage his bottom, no such consequence need be apprehended. When we insist that, without a good portion of *blood*, we can reckon on no general or permanent supply of good nags for the saddle or the harness, possessing fleetness and endurance, our chief purpose is to impress upon American horse-breeders, generally, the absolute necessity of preserving that blood in its purity. A well-formed horse, of cold blood, may, it is true, occasionally get fine stock, especially on large, high-bred mares; but to abandon, therefore, our reliance on the blood of the Eastern courser, which has come down to us, intact, for ages, would be to let go the rudder at sea, because, perchance, the ship might be floated on an even keel into safe harbor. How the measure of excellence is to be applied, and the results to be recorded and preserved, we must not stop to discuss. Those who are opposed to all field-sports, on account of the dissipation and vice with which they are too often accompanied, might yet learn to tolerate what they cannot enjoy. Even Agricultural Fairs and Exhibitions are not always free from profane and immoral indulgences, though under the strictest regulations. In short, the whole business of life is mixed up with good and evil, and is full of compromises. Shall we forego the use of gunpowder, because that "villainous compound" sometimes charges the pistol of the duelist; or throw up, altogether, the use of steam, because human life is sometimes sacrificed by the careless use of it?

POLITICAL VALUE OF THE BRED HORSE.

But it is not only as a question of individual comfort, or of agricultural economy, that the advantages of a breed of superior horses are to be looked at. It is worthy, too, of the serious regard of the *Statesman*, in the higher and more important aspect it presents in a *military point of view*, and as thus connected with our national defences. In *cavalry*, perhaps more than in any other weapon, our locality must always give us an advantage over any invading force. An enemy cannot bring cavalry with him.—With something like a well-arranged system in breeding our horses, this advantage may be turned to great account in time of war. With the forecast that distinguished his military administration, Napoleon had the sagacity to establish *Haras*, or studs, in the several departments of France, where thorough-bred stallions were placed at the service of the common farmer, on terms which barely paid the expense of their keep. But to come nearer home—while every one at all familiar with the incidents of our own Revolution, knows how much was effected in the South by Lee's famous "Legion," few, comparatively, may be aware to what that celebrated corps chiefly owed its efficiency—and yet it is undeniable that in a great measure the *prevalence of blood in his horses* made it at once the scourge and the terror of the enemy. Wonderful in their endurance of hunger, thirst, and fatigue—prompt to strike a blow where it was least expected, and, when forced, as quick to retreat—they may be said to have well earned the description applied to the Parthian steed:

> "*Quot sine aqua Parthus nullia currat equus,*
> How many miles can run the Parthian horse,
> Nor quench his thirst in the fatiguing course!"

ARTIFICIAL MANURES.—The extent to which research has been carried to discover new fertilizers, and the universal conviction, in England, that only by the free use of manures can their lands be kept in heart, is well evinced in one of the excellent letters of Mr. Norton, (the 11th,) published in that most excellent journal the Albany "CULTIVATOR.'

"As Guano begins to fail, (says Mr. Norton,) they are bringing home the bodies of the birds themselves; some of them were lately sent here in order that their value as a manure compared with that of Guano, might be determined by Prof. Johnston. They had lain buried for years under the Guano, and in appearance resembled the smoked geese from the Shetland Islands, sold in the shops here. They are quite saturated with ammonia, and their large bones add much to their value. They would require chopping into small fragments before depositing in the soil, and in consideration of this serious drawback, Prof. Johnston considers them worth about £4 per ton, or nearly $20. Were it not for this difficulty, they would be worth as much as Guano itself."

THE ROYAL AGRICULTURAL SOCIETY OF ENGLAND consists of 6,933 members. They pay their Secretary two thousand dollars a year!

OBITUARY NOTICE OF GEN. T. M. FORMAN OF MARYLAND.

WITH A CURIOUS HISTORY, DERIVED FROM HIM, OF THE IMPORTATION OF THE CELEBRATED STALLION, LINDSEY'S ARABIAN.

THE brilliant exploits performed, in the Revolutionary War, by Lee's famous Legion, alluded to in the close of the preceding chapter, were ascribed at the time, in a great measure, to the *high breeding* of his cavalry horses, rendering that Legion, as already stated, at once "the terror and the scourge of the enemy."

The reader will not take it amiss that we should transfer to our columns the curious account of the importation of that renowned horse. This account was derived by the Editor, from the late General T. M. FORMAN, who was too good a judge of the virtues of a good horse, and when alive loved a good horse too well, to take it amiss that his name should be associated in the same obituary notice, with one so distinguished in equestrian annals. Gen. T. M. Forman was a Revolutionary compeer of such men as Howard and Smith and Guest and Stewart, and survived them all until very lately, respected as a fine specimen of the "time that tried men's souls." He was truly a gentleman of the old school. At the time of his decease, which occurred recently, he must have been more than four score years of age, and yet he continued, sedulously, to the last, not only to bud and graft choice fruit, but to plant the nuts and seeds of forest trees, and to embellish with exotic trees and shrubbery, his much-loved garden, at Rosemount, on the beautiful shores of the Sassafras.

A memoir, in illustration of his partiality for rural life, and his disposition to grace and embellish it with hospitality, literature, and floriculture, is due to his memory, and would be, we need hardly say, an acceptable offering to the pages of the FARMERS' LIBRARY.

LINDSEY'S ARABIAN.

ABOUT the year 1777 or '78, Gen. H. Lee, of the Cavalry, and his officers, had their attention drawn to some uncommonly fine Eastern horses employed in the public service—horses of such superior form and appearance, that the above officers were led to make much inquiry respecting their history; and this proved so extraordinary, that Captain Lindsey was sent to examine and make more particular inquiry respecting the fine cavalry, which had been so much admired, and with instructions, that if the sire answered the description given of him, the Captain was to purchase him, if to be sold

The Captain succeeded in purchasing the horse, who was taken to Virginia, where he covered at a high price and with considerable success.

It was not until this fine horse became old and feeble that the writer of these recollections rode thirty miles expressly to see him. He was a white horse, of the most perfect form and symmetry, rather above fifteen hands high, and although old and crippled, appeared to possess a high and gallant temper, which gave him a lofty and commanding carriage and appearance.

The history of this horse, as given to me during the Revolutionary war, by several respectable persons from Connecticut, at various times, is:—

"For some very important service, rendered by the Commander of a British frigate, to a son of the then Emperor of Morocco, the Emperor presented this horse (the most valuable of his stud) to the Captain, who shipped him on board the frigate, with the sanguine expectation of obtaining a great price for him, if safely landed in England. Either in obedience to orders, or from some other cause, the frigate called at one of the English *West-India* islands, where being obliged to remain some time, the Captain, in compassion to the horse, landed him for the purpose of exercise. No convenient securely enclosed place could be found but a large lumber yard, into which the horse was turned loose; but delighted and playful as a kitten, his liberty soon proved nearly fatal to him. He ascended one of the piles, from which and with it he fell, and broke three of his legs. At this time in the same harbor, the English Captain met with an old acquaintance from one of our now Eastern States. To him he offered the horse, as an animal of inestimable value could he be cured. The Eastern Captain gladly accepted the horse, and knowing he must be detained a considerable time in the Island before he could dispose of his assorted cargo, got the horse on board his vessel, secured him in slings, and very carefully set and bound up his broken legs. It matters not how long he remained in the harbor, or if quite cured before he arrived on our shore; but he did arrive, and he must certainly have covered several seasons, before he was noticed as first mentioned.

"When the writer of these remarks went to see the horse, his first attention was to examine his legs, respecting the reported fracture, and he was fully satisfied, not merely by *seeing* the lumps and inequalities on the three legs, but by actually *feeling* the irregularities and projections of broken bones.

"In Connecticut (I think) this horse was called Ranger; in Virginia (as it should be) he was called Lindsey's Arabian. He was the sire of Tulip and many good runners; to all his stock he gave great perfection of form; and his blood flows in the veins of some of the best horses of the present day. Make what use you please of this statement: I will stand corrected in my narrative, by any person who can produce better testimony respecting Lindsey's Arabian.

"Your obedient servant, F."

September 10, 1827.

TURNIP CULTURE IN ENGLAND.

THE NORTHUMBERLAND PLAN (CONSIDERED THE BEST IN ENGLAND) DESCRIBED.

THE introduction of *Turnip culture*, as a field crop, seems to have been a providential inspiration. It was introduced first, upon a large scale, from Flanders into Norfolk, about two centuries ago, and thence passed into the South of Scotland and the North of England, not until a century after, so dilatory are Farmers in adopting new objects and new processes, adapted to their purposes of life. In Norfolk, we are informed the cultivation of Turnips as winter food for stock, was for a long time confined to one or two individuals, and at last spread widely, and was much accelerated and improved, by adopting the *row, or drill system*, invented by that great benefactor of English Agriculture—JETHRO TULL. The broad cast system is still practiced in Flanders, and to a certain extent, yet prevails in England; though in both countries the laborers *hoe them out*, with a dexterity, which obviates in a great measure, the ill consequences of the broadcast system, as practised in this country—at least in our Southern States. There, however, Turnips form but an insignificant object of regard. Most farmers looking to them, as for centuries they did in England, only as a culinary vegetable; and for that purpose they '*cowpen*' a small piece of old land, and sow their Turnips so thick as to shade the ground, leaving them to their fate, often without even thinning and hoeing. Now, however, that every one is becoming sensible how indispensable it is to increase the quantity, and to improve the quality of his *home-made* manure, it may be expected that more attention will be given to this important crop—important as compared with other root or green crops, on account of the facility of raising, and of preserving it. It is admitted that Turnips in many parts of Europe, are at the foundation of all the best systems of farming, inasmuch as they supply the requisite manure, and at the same time *clean the land* for subsequent crops, by the numerous plowings and harrowings which are indispensable in Turnip culture—a thing very much overlooked by American farmers, who seem not to reflect, that every spear of grass, and every noxious weed, takes from the crops not only the food which it finds in the soil, but its full share of that which floats in the atmosphere. It is admitted that such has been the effect of the introduction of Turnips as a field crop, in England, that without it, she could not have stood up under the load of her national debt.

In the preparation of the ground, and the management of the crop, what is called the *Northumberland* plan is considered the best, and that has been briefly described in the manner that we shall presently see;—the objection that will be raised to it in our country, is the labor it requires; but much better would it be, in most cases, to restrict the labor at command, to one-fourth of the surface, to which it is usually applied, than to waste it as is done, over fields barren by exhaustion, and want of manure; and yet more so by the slovenly and imperfect manner in which they have been tilled.

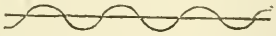
Persuaded that it is too late in the season to offer information which may be availed of now to any great extent, (although we have seen a heavy crop of common Turnips from a sowing on the 10th of September,) we proceed now to give—

THE NORTHUMBERLAND PLAN.

The County of Northumberland has been one of the foremost of the English counties in adopting the improved system of Agriculture—the chief feature of which is the cultivation of turnips for the rearing and fattening of cattle. Turnips accordingly occupy a large proportion of every farm, the soil of which admits of this cultivation. So great has been the advantage derived from this change from the old triennial system, that many fields now yield heavy crops of this useful root which in most other parts of England would be considered as totally unfit for its cultivation. This has arisen from the early adoption of the culture in rows on elevated ridges, which has received the general appellation of the Northumberland method, and which we shall therefore describe with some minuteness.

The ground having been prepared by as many plowings and harrowings as may be thought requisite to pulverize it and destroy the weeds, and laid quite flat, an experienced plowman draws as straight a furrow as possible, and, returning, lays the next furrow slice upon the first, thus completing what is usually called a *bout*. The usual width of the furrow being 9 inches, the first ridge and furrow take up 18 inches; the next furrow slice being laid over the first, the whole work takes a width of 27 inches. He then enters again at the distance of 27 inches from the land side of the first-made furrow, and completes a second bout parallel to the first. When the whole field is thus laid into narrow ridges, which, from the soil being light and crumbling, gives the section of the

surface a waved appearance, such as is represented in the annexed cut, the depressions are



about 6 inches below the former surface, and the ridges as much above. This at once doubles the depth of the cultivated soil in the ridges.—The manure is now brought on the land in small one-horse carts, the wheels of which are about 54 inches apart, so that the horse walks in one furrow while the wheels move in the two adjoining. The manure, which is chiefly common farm-yard dung, not too much decomposed, especially if the soil is inclined to clay, is laid in small heaps, drawn out of the cart by a dung-hook, or, which is better, by a boy standing on the load in the cart, who forks it out more regularly as the horse goes slowly on. It is then laid equally in the furrows by women and boys.—The quantity thus laid on depends on the supply of the yard compared with the breadth of turnips intended to be sown, for the whole is expended on this crop. In general, not less than 15 or 20 single-horse loads per acre are thought necessary to produce a good crop.—Twice that quantity is often put on. This dung is evenly distributed in the furrows to the right and left of that in which it has been deposited from the cart. The plowman now begins to cover this dung by splitting the ridges in two, laying one half to the left and the other to the right, and reversing the bouts, so that the ridges are now directly over the dung, which is completely buried. The appearance of the field after this is exactly similar to what it was after the first bouting. A roller is now drawn over the ridges, to flatten them at the top, in order that they may better receive the seed, which is drilled exactly on the middle of the ridge by a machine attached to the frame of the roller and dragged after it. The roller is usually sufficiently large to roll two ridges at once; and, in that case, two drilling-machines, each guided by a man, are fixed to it, and one horse, walking in the middle furrow, draws the whole apparatus forward. Thus, two men and a horse, with a boy to lead the latter, can drill four or five acres in one summer's day. The drill barrow has a very slight coulter, hollowed out at the back part to receive the tin tube through which the seed is delivered. The simplest construction of that part which distributes the seed is a tin cylinder, or, rather, double cone, with holes in the circumference, through which the seed falls into the tube. The seed-box revolves on an axis, turned by means of a connection with the axis of one of the wheels of the machine, which revolves with it; the other wheel turns round this axis. As long as the first-mentioned wheel goes on the ground, the seed is delivered; but as soon as it is raised, so that the drill proceeds on the other wheel alone, no seed falls through, because the axis no longer turns. Thus none is lost in turning at the ends of the ridges. In very light soils another slight rolling is necessary to press in the seed; but, in stiffer loams, a small chain or piece of iron, dragged after the coulter, is sufficient to cover the seed without rolling.—By this method the seed has not only a greater depth of mellow soil to strike in, but the fermentation of the dung immediately under it acts as a hot-bed, and soon brings it up; by which means it generally is so rapidly in the rough leaf that it seldom suffers from the depredations of the fly. Experience shows that in a moist climate the ridge system produces much more certain and heavier crops than could be expected in general from the most careful broad-cast culture. As soon as the turnip has four leaves out of the ground, the rows may be thinned by the hand or by the hoe, and the plants may be left from eight to ten inches apart. The next process is stirring the ground between the rows with a light one-horse plow. This plow takes a small shallow furrow to the left of the row, within three or four inches of the young plants, and lays it in the middle of the interval between the ridges. When this has been done on both sides all over the field, there will be small ridges formed between the principal ridges on which the turnips grow. All weeds are thus buried, except between the plants in the rows, where they are taken out by the hand or hoe. Some time afterwards, a narrow cultivator, like harrows with crooked tines, which are called *cats' claws*, from their shape, is drawn over the last-made ridge, to pulverize the earth and clear it from all remaining weeds; this is repeated more than once, if it should be thought necessary. Before the Autumn rains set in, or the turnips have too wide spreading tops, a plow with a double mould-board is drawn along the middle of the intervals, and lays half of the pulverized soil on each side against the ridge on which the turnips grow; not to cover the roots and protect them from frost, as some think, but to supply fresh mellow earth for the extending fibres of the root to strike into. In heavy, wet loams, it may be necessary, in order to make a clean, neat furrow between the rows, to let off any surface water, in the latter end of the season, with a double mould-board plow, and dig out deeper water-furrows with the spade across the ridges, where they may be required by the nature of the surface. But this is not often necessary in common turnip soils. By following the above system, Swedish turnips, and even common white turnips, may be raised with success on the heaviest soils; and if taken up early, and stored for winter use, they will leave the land in as good a state for wheat, with one or two plowings, as if it had been fallowed. The carts which take off the turnips will not hurt the land, for the horse walks in a deep furrow, and the wheels move in similar ones, and thus the mellow earth is not trod upon. In order that the dung, which is not yet fully decomposed, may be spread evenly for the next crop, the ridges are often made in a diagonal line across the usual line of plowing. When the turnips are off, one bout of the plow levels each of the ridges, heavy harrows level the whole, and it can be plowed in proper stitches for the sowing of the next crop. Sometimes what is sown immediately, but more frequently barley with clover-seed in spring. In the latter case the Swedish turnips may be left on the ground all winter, and taken up or fed off early in spring.

Though you may traverse the whole of Northumberland without meeting with a single field of turnips sown broad-cast, the drilling of other crops is by no means so common as in Norfolk and Suffolk, where most of the turnips, on the other hand, are still sown broad-cast. The expense of the machines for drilling corn may be one cause of this, but it seems not sufficient to account for it.

It is well known to all good farmers that all the subsequent crops depend on the success of the turnips. These are the source from which manure is provided, and no crop will keep so

much cattle during winter and early spring, with so little exhaustion of soil, as turnips. The manure abundantly put on the land to raise the turnips is a fund laid out at great interest for the benefit of the future crops: for the whole course is benefited by them, especially if they are fed off by folding sheep on them. Whether wheat or barley is sown after turnips, clover and grass-seeds are usually sown amongst it. The land being clean and in good heart, the grasses grow thickly and cover the ground well the year after. In the heavier loams, after the grasses have been once mown for hay, the land is depastured for two or three years, and then it is plowed once and sown with oats. After oats come beans, with some manure, and wheat ends the rotation. This is considered the best course for keeping the land in a state of progressive improvement. On very rich soils another crop of beans or peas may be taken after the wheat, and then wheat or oats again. Few soils, however, except the richest and deepest, will bear this exhausting course; and it is more prudent in general to return to the turnips after the first crop of wheat.

On light gravelly soils, where the clover and grasses soon fall off, the Norfolk system answers best. The turnips are fed off with sheep, or, where the crop is heavy, half the turnips are drawn for oxen and cows and the other half fed off; or, which is a late improvement, they are cut into slices or strips by a machine, and given to the sheep with cut clover hay in shallow troughs on the ground from which turnips were drawn. In this way the turnips go much farther; and the lambs and old ewes will thrive and fatten on them, which they could not have done in the old way for want of teeth to bite them. After turnips come barley and broad clover, with a small portion of annual rye-grass, mown once for hay and plowed up for wheat. The next course is the same, with the variation of some substitute for the broad clover which should not be sown on the same land oftener than once in eight years to ensure good crops. Part of the land may be in peas or tares to cut green, and part in grass-seeds without clover, according to the judgment of the farmer. There are some very heavy and wet soils in the county, which will not readily bear turnips, and where the sheep cannot be folded in winter, nor the turnips carted off without greatly injuring the land. There a fallow is unavoidable at least once in six or seven years. In other respects they are cultivated in a similar manner with good loams. The practice of thorough-draining, which is spreading rapidly, will probably soon banish clean fallows, and substitute turnips in their place, even in the most retentive soils, which will in time be converted into rich loams by the effect of cultivation, loaming, manuring, &c., as may be seen in many old gardens, of which the natural soil was once a retentive clay.

In due time we shall revert to the culture of this root, being satisfied that notwithstanding certain and serious impediments, tending to frustrate the best directed attempts to cultivate Turnips, especially in the Southern low lands of this country, on any thing at all approaching the scale on which it is practised in England, the Swedish Turnip might still be made to contribute largely and profitably to the sustenance of beasts, and so to the accumulation of manure—the fertility of the land, and the increase of all other crops. For this impression we might rely for strong support, on the heavy crops we saw, near maturity, last Autumn at Marshfield, and at Hereford Hall.

UNDER-DRAINING.

ONE OF THE GRAND IMPROVEMENTS IN PROGRESS TO SUPPLY BREAD TO THE INCREASING POPULATION OF ENGLAND.

There are now in progress, in Great Britain, two great and fruitful means of adding to the Agricultural products of the country, so much needed by the growth of her population, to wit: Under-Draining and Irrigation. Of these two great modes of fertilizing land, the one the most expensive, the other the most beautiful of all agricultural operations; the latter only, in the opinion of an American citizen of profound judgment, who looks at such things with the eyes of a Bacon or a Brindley, is applicable to our country to any great extent.

Under-draining, which answers its purpose only where it is thoroughly performed, is, perhaps, too expensive for *extensive use* in America. Like Iron works, the establishment of which costs so much money, few have capital equal to the enterprise, but those who have, get the better paid for their investment. We have, however, seen under-draining practised with eminent skill and success, by a very plain, unpretending, worthy farmer, in Prince Georges county, Maryland, with results that do high honor to his sagacity and forecast; and the more so as, probably, he had never read any description, or seen any specimens of the manner of conducting it. He, Mr. Somers, residing some miles below Nottingham, in Prince Georges county, has successfully under-drained boggy meadows and adjacent upland, by means of large poles laid along side of each other, and covered in a peculiar and careful manner with cedar brush, and then with sods and dirt. His example is well worthy of being imitated, and might be, at

least on a small scale, in a thousand instances in his own county, with profit and with credit; and why should not the farmer be as ambitious of credit, for the appearance of his farm, as the commander about the cleanliness and discipline of his ship, or a Colonel for that of his regiment?

On the importance of *draining*, so much neglected in our country, as far as our observation has extended, (with some memorable exceptions, such as may be seen at Indian Hill,) we can only repeat the persuasion heretofore expressed, that next after, if not before thorough tillage, in importance, as in fact, it should precede all tillage, is *thorough draining*—a process aptly denominated the mother of all agricultural improvement. To this, the young farmer on coming to his estate should give his first attention; and here again we perceive the necessity for early instruction in the principles of hydraulics, so far at least as to know the laws which govern the rise and the running of water; for all attempts at draining must ultimately fail, if not conducted with reference to such principles, whether they be learned by experience, sometimes dearly bought, or by studying at school the science of the thing. It will ever be in vain to look for good crops, either of grain or grass, until the land has been drained of all superfluous moisture; and yet there are few farmers who might not reclaim portions of their land by draining judiciously conducted, which would, when so reclaimed, be the most productive portions of their estate, and well supply the place of such as they might profitably sell, or give to their children. At all events, such eye sores as these wet spots, throwing up useless if not noxious *grasses*, and exhaling malaria, are disgusting to look upon, and ought to be deemed as disgraceful to any practical farmer as galls on the back or shoulders of his working animals. Lindenwold, under the careful management of Ex-President VAN BUREN, is understood to exhibit remarkable specimens of perseverance and skill in the art and economy of *draining*.

In due time, as we can get opportunity, the patrons of the Farmers' Library shall be put in possession of full information as to the principles and most approved materials and system, for performing this great means of reclaiming, in many cases, the most valuable portions of their land, leaving them to decide how far they possess the means of carrying it out, each one in his own case. This is one of the cases where men of fortune and liberal spirit might render essential service to Agriculture, by putting in operation some specimens of the most approved methods of under-draining, in order to test, for the benefit of those whose more limited means make it imprudent for them to lead the way—the actual expenses and results. The scale of expenses abroad, on account of difference of cost of labor and materials, may not apply in America, but the necessary allowance on these points may be made, while the effects in regard to the melioration of the land, and the increase of its crop, would be alike in both countries.

Our readers may be interested in the testimony given before the *Tamworth Agricultural Society*, on the results of reclaiming land by under-draining, by Lord STANLEY, at a meeting of that Association last year.

"It was impossible to cast round their eyes about the country in which they lived, and not acknowledge that there had been a vast improvement in the practical agriculture of this country within the last ten or fifteen years. In producing that improvement he firmly believed that this society had borne its full share, and he should deeply regret if any circumstance whatever deprived it of that support which all who were engaged in the cultivation of the soil ought to render it. Perhaps they would permit him to make a few observations on two subjects which were of primary and vital importance in the science—for it was now becoming a science—of agriculture, without which all others were comparatively worthless. A real, effectual, and thorough draining of the soil was of vast importance in the first instance, and it was the foundation of all improvement. Now it was quite true that agriculture was not capable of that indefinite extension by which the manufacturing interest, in its rapid progress, had astonished the world, and astonished itself; but it was equally true that agriculture was capable of vast extension and improvement. The surface of the soil was limited, and the capacity of the soil was also limited; but they were limited in a much less degree than was generally supposed; and he spoke with the greatest confidence when he said that, of the waste lands of this country, a vast proportion was capable of producing a large profit on a large—an immensely large—outlay of capital expended upon it; and, considering the condition of the country, and the increasing population of the country, it was not only their interest, but it was also their bounden duty, to exert themselves, and to apply their best energies, not of sinews alone, but of the mind and intellect, to ascertain how the soil could be made more capable of supporting the population. The importance of thorough draining was universally admitted, but, perhaps, he might be permitted to state two or three facts as practical results, which had come under his own observation, showing that what he was preaching to them, he was, in a certain degree, practising himself. In the course of the last two or three years, they—he spoke for his father as well as for himself—on behalf of themselves and their tenants, had put under ground nearer three than two and a-half million of tiles, and had thus fairly indicated their belief and confidence in the success of a great experiment. And why had they done so? Every month that passed over his head convinced him that, so far from having done all that could be done, they had only made a beginning, and were only doing that which it was not only their bounden duty, but, still more, their abundant interest to do. He would state one instance of the practical returns which might be expected from thorough scientific draining. In 1841, his father was about to inclose in the park at Knowsley, a

tract of about eighty acres. Of this eighty acres about twenty were strong clay land, with a very retentive subsoil, and the remaining sixty he remembered from his boyhood as the favorite haunt of snipes and wild ducks, and never saw there any thing else. In the course of the first year the sixty acres maintained, and maintained very poorly, during the summer, six horses; and on the twenty acres there was a very small crop of very poor hay. It was impossible for land to be in a poorer condition; and they would agree with him when he told them that, in breaking it up, they had some two or three times to dig the plough horses out of the bog. In 1841 the whole of this land was thoroughly subsoiled and drained, and in 1842, what was not worth 10s. an acre the year before, was in turnips, and on that land they fed off in five months, and fattened for the butcher, 80 beasts and 300 sheep, and afterwards carted into the farm-yard 350 tons of turnips. In the present year they had a very fair crop of barley and oats, which his friend Mr. Henry would be very glad to show to any gentleman who felt any curiosity on the subject. Now he did not hesitate to say that that land was, at that moment, worth 30s. an acre. The outlay upon it for pulling up old fences, thorough draining, tilling and breaking it up, amounted to just £7 10s. per acre, just giving 20s. for every 150s. of outlay, and giving to the landlord a permanent interest of 14 per cent. on the money laid out on that unpromising ground. It happened that, in the same year, they took into their own hands land which had been abandoned by the tenant as perfectly worthless. It was a large field of twenty-two acres of very poor sandy soil. It was drained at an expense of £2 per statute acre, and in the first year they fed off on that land 120 sheep, the remaining part of the turnips being carted to the farm-yard, and he ventured to say that, at the expense of £2 per acre, the land as increased in value 10s. per acre to the landlord and 10s. to the tenant.

IRRIGATION.

HOW CONDUCTED—ITS VALUABLE RESULTS STATED.

This is one of the two great fertilizing expedients, of which we have already spoken, as now operating wonders for the agriculture of England; *under-draining*, as there practised, being too costly for American Farmers generally, while *irrigation* is within the means of many, on whose estates springs and streams of larger or smaller volume, invite this use of a great and cheap resource for the increase of their crops, as well of grain as of grass.

Here we take leave to repeat from a discourse delivered recently before, and at the request of the New-Castle county, Delaware, Agricultural Society, a few remarks which we had there the honor to submit, on the value of this operation:

Irrigation is, in my view, another means of augmenting agricultural products in a degree that farmers seem not to be generally aware of; and there is not a district teacher in the State who might not in a few hours comprehend and instruct his pupils in the *rationale* of this important operation. A single chapter in such text books as you ought to have provided for your common schools, with diagrams to illustrate the process, would render the whole subject at once familiar to the dullest capacity. 'It is apparent to the most superficial observation,' says an experienced writer on this topic, 'that the places contiguous to springs, over which their waters continue to *flow*, are ever covered with a conspicuous verdure of the sweetest grasses; while stagnant water converts the land into *marsh*, productive of nothing but coarse and unpalatable aquatic plants. To imitate this process of nature constitutes the leading principle of *irrigation*' In fact, my friends, the object of the physical sciences, at the mere suggestion of which, in connexion with their business, practical farmers are prone to take alarm, after all, is but to observe and to imitate and regulate the processes of nature.

How many there are who have small streams passing through their farms, which, if taken at their sources and conducted along the highest line that the water would flow, might be made to irrigate and fructify every acre over which they could be turned; and he must be slow in the comprehension of his interest, who does not see how profitable, under favorable circumstances, is all land kept under the scythe, compared with that which demands frequent plowing, especially in a country like ours, where the dearness of farm labor stands like a 'lion in the path' of rural improvement. In the practice of this important and beautiful operation, our country is, especially, much behind others which are much in the rear of us in general intelligence, and in that natural shrewdness and readiness to take a hint which is said to characterize 'the universal Yankee nation.'

The writer on irrigation, who laid down the general principle in the words I have quoted, gives many very striking instances of the profits resulting from it in England and Scotland, as well as on the Continent; otherwise, I have heard the rules and results of irrigation no where so well stated as by Mr. Webster, with his usual clearness, on his return from England. Under a strong persuasion that this is a practicable but much neglected resource, within the reach of American farmers, you will bear with me while I rehearse a few of the examples to show the advantages of irrigation given by the writer already mentioned.

R. K. Campbell, of Kailzie, commenced irrigating, by forming 5¾ acres of the lower part of his lawn into water meadow. In its natural state it was worth $10 an acre yearly rent, which some years since was the yearly rent of the Delaware meadows, below Philadelphia.

The formation of the meadow cost $37 50 per acre, and, for the last 20 years, the grass produce of this land, in hay and after-grass, has been, annually, $55 per acre—the hay crop being 6,600 pounds per acre of the finest quality. The same gentleman has another irrigated meadow of 8¾ acres, formed out of a perfect bog, only worth originally 5 shillings annual rent per acre. The expense of forming this meadow was $27 50 per acre. It has since yielded, in hay and after-grass, to be fed off to sheep an annual income of $27 50, in place of $1 25 per acre.

The late Sir George Montgomery, in 1815, converted 9 acres of partly boggy and the remainder dry soil, worth ten dollars yearly rent, into irrigated meadow, at a cost of $25 per acre. It has since yielded 6,600 lbs. of very superior hay to the acre, and its gross produce is $55 per acre. In 1802, a 9-acre lot, belonging to the Duke of Bedford, was prepared for irrigation, and in 1803 it produced as follows: In March, it was stocked with 240 sheep, for 3 weeks, at 6d. each per week, making £18, or $10 an acre, for the *spring* feed alone. In June, mowed 2 tons of hay to the acre, worth, as per statement, $26 a ton; August 20, mowed again 1½ ton an acre, at £4 per ton; September 16, put on 80 fat sheep, for 3 weeks, at 4d. each per week; and then it fed lean bullocks, not reckoned in the account—making from the 9 acres $740, or $80 per acre of annual produce.

I once heard Mr. Crowninshield, then Secretary of the Navy say that he gave $100 an acre for land in Massachusetts, and had to pay $50 an acre to *clear it of stone*, before it could be plowed. I saw land being ditched, cleared, and cleansed of alders and stone, at Indian Hill, in Massachusetts, requiring more labor to get up one acre than is expended in the ordinary way on 100 acres in Delaware or Maryland. But what is impossible to indomitable perseverance? The very aspect of such land is terrible to a Southern man; yet, suppose, by an outlay of $10, or even $20, or $30 an acre, in ditching, draining, or irrigation, a Delaware farmer would, as many might, reclaim otherwise worthless land, making it produce, without further cultivation, say 2 tons of hay, worth on the spot at least $10 per ton, at the same time dissipating sources of autumnal disease, and rendering his farm at once more beautiful and more productive; how much better and more patriotic would it be than pusillanimously to flee across the mountains, he knows not where, far away from the grave of his fathers and the endearing associations of his youthful pastime, ay, and of youthful sorrows? Has not he already lost the best part of his nature who has ceased to feel in heart that there is, indeed, "no place like home?" Would that Americans could forego the love of change for change sake, and acquire, in place of it, something of that love of home, however humble it be, which prompted one of England's best poets to say of the Swiss,

"Dear is that shed to which his soul conforms
And dear that hill which lifts him to the storms."

But, when driven to seek a home in other States, there are districts near at hand, in some of the "Old Thirteen," far more inviting than the rude borders and dense forests of the distant West.

Liebig informs us that "in the vicinity of Liegen, (a town in Nassau,) from three to five perfect crops are obtained from one meadow, and this is effected by covering the fields with river water, which is conducted over the meadow in Spring by numerous small canals. This is found to be of such advantage, that supposing a meadow not so treated, to yield one thousand pounds of hay, then from one thus watered 4500 pounds are produced. In respect to the cultivation of meadows, the country around Liegen, is considered to be the best in all Germany."

ON IRRIGATION....By Rev. W. L. RHAM.

OF all the substances which concur in the vegetation and growth of plants, water is the most essential; without moisture the seed cannot germinate, nor can the plant receive nourishment. Hence, in warm climates, where rains are periodical, and where the soil is dried and parched by a continued evaporation, no verdure exists, except where springs or rivers supply the waste of moisture. The warmer the climate and the more rapid the evaporation, the more luxuriant is the vegetation, provided there be an abundant supply of water. This circumstance has suggested the plan of diverting streams and conducting them in channels to fertilize as great an extent of land as possible.

In China and in India, as well as in Egypt, ingenious modes of watering lands have been adopted from the most remote ages. No expense has been thought too great to secure a supply of water, and to distribute it in the most advantageous manner. It seems that where there is great heat in the air, water alone will supply the necessary food for the growth of plants. It is probable that the component parts of the atmosphere are more easily separated, and made to enter into new combinations with those of water, in a high temperature than in a lower; or that the leaves and green parts of vegetables imbibe water in a state of solution in air, and that in this state it is more easily decomposed. Atmospheric air and water contain all the principal elements of vegetables, viz. oxygen, hydrogen, carbon, and nitrogen; the remainder are either found in the soil or diffused through the water. Manures seem to act principally as stimulants or reagents, and are themselves composed of the same elements: they are of no use unless diffused or dissolved in water; but when the water is impregnated with animal or vegetable substances, the effect is far greater and more rapid than when the water is pure.

Water has also an important office to perform, if we admit the principle discovered by Macaire, that plants reject through their roots those portions of the sap which are the residue of its elaboration, and which are of no further use to the plant, but rather injurious if they are again imbibed by the roots. Plants seem to require a removal of their excrements, as animals do when tied up in stalls or confined in a small space. If this is not effected, they suffer and contract diseases. The percolation of water through the soil is the means which Nature has provided for this purpose. Hence we can readily suppose that the mere washing of the roots has a beneficial effect, and to this in a great measure must be ascribed the fertilizing effects of pure and soft running water.

If water stagnates and is evaporated, and the noxious matter held in solution remains in the soil, all the advantage of irrigation is lost, and the better kinds of grasses are succeeded by

rushes and coarse aquatic plants, as may be seen in all marshy spots. The circulation of the water, therefore, appears to be as necessary as its presence; and, provided there be a sufficient supply of water of a proper quality, the more porous the soil, and especially the subsoil, is, the more vigorous is the vegetation. It is on this principle alone that we can rationally account for the great advantage of irrigation in those climates where rain is abundant, and where the soil, which is most benefited by having a supply of water running through it, is of a nature to require artificial draining as an indispensable preliminary to being made fertile by irrigation. By keeping these principles in view, great light will be thrown on the practical part of irrigation, which, having been long established by experience, before these principles were thought of, depends not on their correctness, but only confirms their truth.

The whole art of irrigation may be deduced from two simple rules, which are, first, to give a sufficient supply of water during all the time the plants are growing, and, secondly, never to allow it to accumulate so long as to stagnate.—We shall see hereafter one apparent exception to this last rule, but it will be readily explained.

The supply of water must come from natural lakes and rivers, or from artificial wells and ponds, in which it is collected in sufficient quantity to disperse it over a certain surface. As the water must flow over the land, or in channels through it, the supply must be above the level of the land to be irrigated. This is generally the principal object to be considered. If no water can be conducted to a reservoir above the level of the land, it cannot be irrigated. But there must also be a ready exit for the water, and, therefore, the land must not be so low as the natural level of the common receptacle of the waters, whether it be a lake or the sea, to which they run. The taking of the level is, therefore, the first step towards an attempt to irrigate any lands.

Along the banks of running streams Nature points out the declivity. A channel, which receives the water at a point higher than that to which the river flows, may be dug with a much smaller declivity than that of the bed of the river, and made to carry the water much higher than the natural banks. It may thence be distributed so as to descend slowly, and water a considerable extent of ground in its way to rejoin the stream. This is, by far, the most common mode of irrigation, and the shape, size, and direction of the channels are regulated by the nature of the surface and other circumstances, which vary in almost every situation. A few examples will give to those who are not acquainted with the best modes of irrigating land a pretty accurate notion of the system.

We shall suppose a river to run with a rapid current between high banks. At some point of its course a portion of the water is diverted into a canal dug along the bank, with a very small declivity. The water in this canal will flow with less rapidity than the river, but will keep the same level as that part of the river where it has its origin. Thus the water may be carried over lands which are situated considerably above the bed of the river farther down. All the lands between this canal and the river may be irrigated, if there is a sufficient supply of water. The canal may be carried to considerable distance from the river. The size of the canal and its declivity depend on the quantity of water which may be made to flow into it. A dam is often constructed across a river, in order that as much of its water as is possible may be diverted, and the original channel is often laid quite dry, to take advantage of all the water at the time when it is advantageous to irrigate the land. To have an entire command of the water, there are flood-gates on the main channel and on the lesser branches. By opening or shutting these, the water may be stopped or made to flow, as may be required. It must be remembered, that to carry water to a considerable distance, and in great quantity, a larger channel and more rapid declivity are required; and it is a matter of calculation whether it is most advantageous to bring a smaller quantity to a higher point, or a greater abundance somewhat lower. Having a certain command of water, it may be carried from the main channel by smaller branches to different points, so as to irrigate the whole equally.—These branches should be nearly horizontal, that the water may overflow the sides of them, and be equally distributed over the land immediately below. Every branch which brings water over the land should have a corresponding channel below to carry it off; for the water must never be allowed to stop and stagnate. When it has run 15 or 20 feet, according to the declivity, over the land situated below the *feeder*, or the channel which brings the water, it should be collected into a drain to be carried off, unless it can be used to irrigate lands which lie still lower. Finally it runs back into the river from which it was taken, at a lower point of its course.

When there is a considerable fall and a sufficient supply of water, a series of channels may be made, so situated below each other, that the second collects the water which the first has supplied, and in its turn becomes a feeder to irrigate the lower parts of the declivity: a third channel receives the water and distributes it lower down, until the last pours it into the river. This is called *catch-work*, because the water is caught from one channel to another. This method is only applicable where there is a considerable fall of water and a gentle declivity towards the river. But it must be borne in mind that the water is deteriorated for the purpose of irrigation, when it has passed over the land, and that it is not advantageous to let it flow over a great extent when a fresh supply can be obtained: but where only a small portion of water can be commanded, that must be made the most of; and it will irrigate three or four portions of land in succession, without there being any very marked difference in the effect: beyond this it rapidly loses its fertilizing qualities. This is not owing to the water having deposited the fertilizing substances which it held in solution, or which were diffused through it, but it is owing to its having taken up some which are detrimental to vegetation, and being saturated with them: at least this is the most probable opinion when all circumstances are taken into the account.

The general principle of irrigation may be described as the supplying of every portion of the surface with an abundance of water, and taking it off again rapidly. In many situations the great difficulty in irrigation arises from the want of a supply of water; but even then a partial irrigation may be effected, which, although not perfect, will have its advantages. A small rill, which is often quite dry in summer, may still, by judicious management, be made to im-

prove a considerable portion of land: its waters may be collected and allowed to accumulate in a pond or reservoir, and let out occasionally, so that none be lost or run to waste. If there is but a small quantity, it must be husbanded and made to flow over as great a surface as possible. If there is water only at particular seasons of the year, and at a time when it would not be of much use to the land, it may be kept in ponds, and it will lose none of its qualities by being exposed to the air. If animal or vegetable matter, in a partial state of decomposition, is added to this water, it will much improve its quality, and, by a judicious distribution of it over the land, a great benefit may be obtained.

If there is not a want of water, there may be a want of declivity to enable it to flow off, which, it should always be remembered, is an essential part of irrigation. Art may in this case assist Nature by forming a passage for the water, either in its course towards the land to be irrigated, or from it after it has effected its purpose. Where there is no natural exit, and it might lead to too great an expense to make an artificial one, the water may sometimes be led into shallow ponds, where a great part is evaporated; or porous strata may be found by boring, into which it can be made to run and be dispersed. Along rivers, where the fall is very imperceptible, a channel, brought from a considerable distance, may give such a command as to throw the water over a great extent of surface; and, to carry it off, another channel may be cut, emptying itself at some distance below: so that lands which lie along the banks of a river may be irrigated, although they are actually below the level of the river, and require banks to protect them from inundation.

When the surface to be irrigated is very flat and nearly level, it is necessary to form artificial slopes for the water to run over. The whole of the ground is laid in broad beds, undulating like the waves of the sea. The upper part of these beds is quite level from end to end, and here the channel or float which brings the water on is cut. From the edge of this channel the ground is made to slope a foot or two on both sides, and a ditch is cut at the bottom parallel to the float. The whole of the ground is laid out in these beds. All the floats are supplied by a main channel at right angles to the beds, and somewhat above them; and all the ditches or drains run into a main ditch, parallel to the main float, and below the lowest drain. The course of the water is very regular. As soon as the flood-gates are opened, it flows into all the upper channels, which it fills till they overflow in their whole length. The sloping sides are covered with a thin sheet of running water, which the lower drains collect and carry into the main ditch.

WATER MEADOWS.

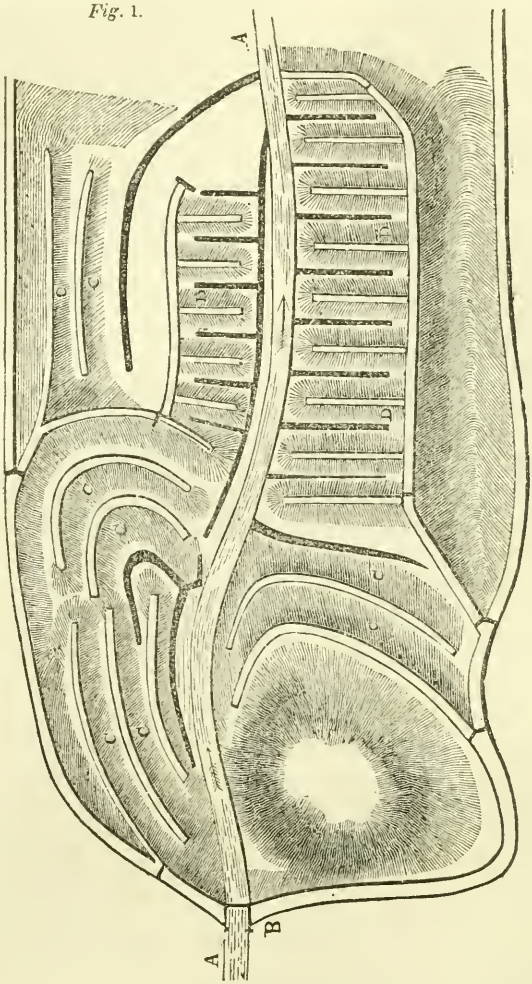
HOW MADE AND MANAGED.

Experience has shown that there are particular seasons when the water has the best effect; a perfect command of it is therefore indispensable, and also a regular supply. During frost, when all dry meadows are in a state of torpor, and the vegetation is suspended, the water-meadows, having a current of water continually flowing over them, are protected from the effect of frost, and the grass will continue to grow as long as the water flows over it. Too much moisture, however, would be injurious, and the meadows are therefore laid dry by shutting the flood-gates, whenever the temperature of the air is above freezing. By this management the grass grows rapidly at the first sign of Spring. Before the dry upland meadows have recovered the effects of frost and begun to vegetate, the herbage of the water-meadows is already luxuriant. As soon as they are fed off, or cut for the first crop of hay, the water is immediately put on again, but for a shorter time; for the warmer the air, the less time will the grass bear to be covered with water. A renewed growth soon appears, and the grass is ready to be cut a second time when the dry meadows only give their first crop. Thus, by judicious management, three or four crops of grass are obtained in each season, or only one abundant crop is made into hay, and the sheep and cattle feed off the others. The usual way in which the grass of water-meadows is made profitable is by feeding ewes which have early lambs till the middle of April. A short flooding soon reproduces a crop, which is mown for hay in June; another flooding gives an abundant aftermath, which is either mown for hay, or fed off by cows, bullocks, and horses; for at this time the sheep, if pastured in water-meadows, are very subject to the rot. The value of good water-meadows could scarcely be believed by those who are not familiar with them. Where the water is suited to irrigation, they never require manuring. The fertility is kept up continually, and the only attention required is to weed out coarse aquatic plants, which are neither nutritious nor wholesome in hay or pasture.

The best soil for a water-meadow is a good gravel. The finest water-meadows on the Avon in Wiltshire, where the richest herbage is found, have scarcely any soil at all, but are on a bed of shingle and pebbles, matted together by the roots of the grass, which proves to demonstration that the waters of the Avon contain all the principles essential to rapid vegetation. Great attention is required, and some experience, to irrigate meadows so as to give the greatest profit.

In hot weather, when we should imagine that the land must be thirsty, and that too much water cannot be poured over it, much mischief may be done by injudicious flooding. In Winter, on the contrary, the land may be covered with water for weeks without injury; and, if an earthy deposit takes place, the subsequent fertility is greatly increased. But this is not properly irrigation: it is inundation, and the effects depend

Fig. 1.



on entirely different causes. When low meadows are inundated in Winter and Spring, it is the muddiness of the water which enriches the land: a fine layer of extremely divided matter is deposited, and, when the water subsides, this acts as a coat of manure.

Water may be carried in small channels through meadows without being allowed to overflow; and in this case the effect is similar to that caused by rivers or brooks, which wind slowly through valleys, and produce a rich verdure along their course. This is watering, but not properly irrigating. When this is done judiciously, the effect is very nearly the same as when the land is irrigated; and in hot climates it may be preferable, by giving a constant supply of moisture to the roots, while the plants are growing. The great advantage of water-meadows in England is not so much the superior quantity of grass or hay which is obtained when they are mown, as the early feed in Spring, when all kinds of nutritive fodder are scarce; when the turnips are consumed before the natural grass or the rye sown for that purpose is fit to be fed off, the water-meadows afford abundant pasture to ewes and lambs, which by this means are brought to an early market. The Farmer who has water-meadows can put his ewes earlier to the ram, without fear of wanting food for them and their lambs in March, which is the most trying season of the year for those who have sheep. At that time an acre of good grass may be worth as much for a month as a later crop would for the remainder of the year. When it is intended to form a water-meadow on a surface which is nearly level, or where a fall of only two or three feet can be obtained in a considerable length, the whole of the land must be laid in beds about 20 or 30 feet wide—the middle or crown of these beds being on a

level with the main feeders, and the bottoms or drains on a level with the lower exit of the water, or a little above it. To form these beds most expeditiously, if the ground is already in grass, the sod may be pared off and relaid after the beds are formed, by which means the grass will be sooner reëstablished; but except in very heavy soils, where the grass is some time in taking root, the easiest and cheapest way is to plow the land two or three times towards the centre, and dig out the drain with the spade: the earth out of the drains, and that which is taken out of the upper trench or feeder, may be spread over the bed to give it the proper slope. A roller, passed over the bed in the direction of its length, will lay it even; and, the seeds of grasses being sown over it, the water may be let on for a very short time to make them spring. As soon as the grass is two or three inches above ground, a regular flooding may be given, and in a very short time the sward will be complete. Instead of sowing seed, tufts of grass cut from old sward may be spread over the newly-formed beds, and they will soon cover the ground. The Italian rye-grass, which has been lately introduced into this country from Lombardy and Switzerland, grows so rapidly, that if it be sown in February, or as soon as the snow and frost are gone, it will afford a good crop to feed off in April, or to mow for hay by the beginning of May; and after that it may be cut repeatedly during the Summer. But where the soil is good and the water abundant, good natural grasses will spring up without much sowing, and soon equal the old water-meadows.

It seems essential to the formation of a good water-meadow that the bottom be porous and free from stagnant water; hence under-draining is often indispensable before a water-meadow can be established; and a peat-bog, if drained and consolidated, may have water carried over its surface, and produce very good herbage. If the soil is a very stiff clay, draining is almost indispensable where a water-meadow is to be made. The more porous the soil, the less depth of water is required, which is not obvious at first sight; but the clay lets the water run over the surface without soaking into the roots, whereas the porous soil is soon soaked to a considerable depth. The water must therefore be longer on the clay than on the sand or gravel, to produce the same effect. If the water is properly applied, all kinds of soils may be converted into fertile water-meadows. On very stiff clays, a coat of sand or gravel, where it can be easily put on, will greatly improve the herbage. It should not be plowed in, but laid on the surface two or three inches thick: chalk will also improve the herbage.

The usual time of letting on the water on water-meadows is just before Christmas, and it may continue to flow over the land as long as the frost lasts: in mild weather it may be turned off during the day and put on again at night until the frost is gone. The grass will soon begin to grow, and be ready to be fed off. When this is done, the water is immediately let on for a short time, and turned off again to allow the ground to dry after a few days' flooding, and the water is let on again at short intervals. The warmer the air is, the shorter time must the water be allowed to cover the meadows. As soon as the grass is five or six inches long, it must be left dry entirely till it is mown or fed off. In Summer the floodings must be very short, seldom more than twenty-four hours at a time, but frequent. Thus a great weight of grass may be obtained, year after year, without any manure being put on the land—care being taken that, where the surface is not quite even, the hollows be filled up with earth brought from another place, or dug out of the drain, if that should be partially filled up with the soil which the water has carried into it. We alluded before to a case where water may remain a considerable time on the land without injury; this is when there are inundations from rivers, which rise above their beds in Spring, and cover the low meadows which lie along their banks. In this case the grass, which had not yet sprung up, is protected from the cold; and, if there is a deposit from the water, there is a considerable advantage. But, when it subsides, it must be made to run off entirely, without leaving small pools, by which the grass would invariably be injured. Small ditches or channels are usually dug, by which all the water may run off, unless where the subsoil is very porous, or the land is well under-drained, which is seldom the case in these low meadows, for the drains would be apt to be choked by the earthy deposit from the water. These inundations can sometimes be regulated by means of dykes and flood-gates, in which case they partake of the advantages of irrigation, and also of that deposition of fertilizing mud which is called warping. [WARPING.]

The preceding plan (*Fig.* 1) will explain what has been briefly said respecting the different modes of irrigating land. A A is a river, which has a considerable fall, and then flows through a level plain. A considerable channel is cut at B, where there is a rapid fall over a natural or artificial dam. This channel is carried round a hill and supplies a series of channels, C, C, C, placed below each other, forming catch-work along a declivity. A portion of the water goes on to D, where it supplies the feeders of a regular set of ridges, or beds, made as before described, from which the water returns into the river by a main trench, into which all the drains run.

On the other side of the river, where the slopes lie somewhat differently, there are several examples of catch-work, the black lines representing the drains which receive the water after it has flowed over the surface and carry it into the river below. It is evident that all the feeders are nearly horizontal, to allow the water to flow over their sides.

Fig. 2.

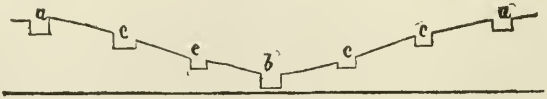
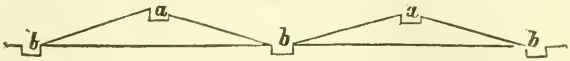


Fig. 2 is the section of catch-work. *a, a,* are the feeders; *b,* the drain; *c, c, c, c,* intermediate channels which act as feeders and drains.

Fig. 3.



Ridge-work.

Fig. 3 is the section of two adjoining ridges. *a*, *a*, the feeders; *b*, *b*, *b*, the drains.

Fig. 4.

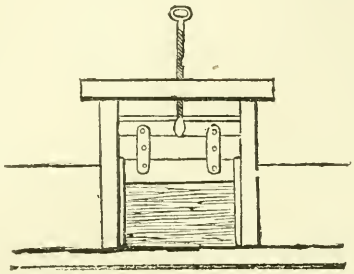


Fig. 4 is a sluice to regulate the flow of water.

PLANT WATERING.

As good potting is the first step in plant growing, so good watering is most assuredly the second; the former, even when rightly accomplished and with the best materials, may be defeated through want of skill in watering.—Imperfect knowledge or carelessness in the due administration of this essential element kills more plants, or keeps more in suspense between life and death, than utter ignorance in all other matters relating to plant growing. Let us not imagine that because we have put a root to a plant, and placed it in a pot in the right way and in the proper kind of soil, that the object of our solicitude is accomplished, and that our duty is terminated; for the contrary is the fact, if we have ambition enough to desire our achievements to be admired or recorded.

It may be superfluous to state, that plants either suffer from too much or too little water; but it is not so to show that this is frequently the case in the same pot at the same time; that is an evil far more extensive in a general collection of plants than may be supposed, and a point opposed to good cultivation earnestly demanding our attention. When the surface-soil in the pots becomes dry, a careless hand adds at once a fresh supply, without ascertaining whether the soil, in which the roots are, at all requires it, and again on the other hand, the top soil frequently appears perfectly wet, while the bottom of the ball is as dry as dust. This is a most calamitous circumstance, and one of common occurrence, especially amongst newly-potted plants. When a plant is just potted, it should have a sufficient supply to penetrate every part of the ball, and then remain until another supply is positively required, that is, till the ball has parted with a greater portion of its moisture and the plant is upon the point of flagging, the interstices being all filled with air as it should be. This air again requires to be driven out by a fresh supply of water, thus keeping up a vigorous and healthy action by continual interchanges of air and water, but at the same time never allowing either of them to remain long enough to affect the health of the plant. Watering by "driblets" is the worst of all watering; it keeps the surface of the soil in a puddle, but never reaches the roots; the eye is thus deceived, and the plant is often dead before the cause is discovered. When a plant does not part with its moisture freely, like its neighbors, but remains in a wet state, it should be immediately inspected; for should a plant remain subject daily to the application of driblets of water for any time, death must of necessity ensue. One effectual watering, whether applied to plants in pots under glass or to those committed to the soil in the open ground, is not only of far greater utility, but much more economical than ten ineffectual supplies. There is no duty attending plant cultivation so difficult to perform as this, and to entrust it in careless and incompetent hands will certainly entail upon a collection of valuable plants positive ruin; for unless he who uses the watering-pot has some practical acquaintance with vegetable economy, and can discriminate so far as to act agreeably to the necessities and wants of the subjects committed to his care, he will always find himself a day's march in arrear. These necessities and wants, be it remembered, are not quite so apparent to the naked eye of the novice as they are to the keen and scrutinizing vision of the ever-anxious, and hence ever-watchful, cultivator

There is a kind of watering very commonly performed in many places, which cannot, when

valuable and choice plants are attempted to be cultivated, be too severely censured. This is the daily afternoon supply, which is given to every plant as far as time will admit, regardless of its requirements.—at least, when this operation is entrusted to men of inexperience, which is but too common; and this kind of gardening goes on in many places for years. Plants die, it is true; but this is one of the unresolved mysteries in gardening, which, to some minds, is quite satisfactory, and enables them to account for the loss of plants by violent means. Finally, it has been asked, how often are we to water this or that plant, and the answer usually is, always when it requires it; let us, therefore, add, and with some earnestness, *never before.* [Duro.

ENTOMOLOGY:

OR, A DISCOURSE ON INSECTS.

"A wise hand has scattered them every where, and given to each kind its particular instinct, its peculiar economy, and great fecundity."

"FROM the gigantic banyan, which covers acres with its shade, to the tiny fungus, scarcely visible to the naked eye, the vegetable creation is one vast banquet, at which her insect guests sit down." The experience of every practical Farmer will bear its testimony to the truth of this assertion, which we quote from an eminent work on Entomology, not for the purpose of spreading a truth which must be universally admitted by every intelligent observer of Nature, but as an apology, or, rather, a reason, for occupying a few pages of an early number of the Farmers' Library with the remarks to which it properly leads.

Experience also teaches every cultivator of the soil that innumerable varieties of this minuter portion of the animal kingdom are unbidden and costly "guests" at his own private table—feeding on his industry, preying on his means, and diminishing his profits.

Decandolle and other Entomological writers have calculated that the number of these insects which draw their sustenance from herbivorous plants, amounts to 100,000 species. Some of these feed only on one kind of plant, while others inhabit a plant in one section, or season, and not in another. One species, furnished by Nature with an organic machinery, admirably adapted for boring or burrowing in the earth, assails the root; another inserts its proboscis in the fibre of the leaf, and extracts only the sap: this eats only the parenchyma, never touching the cuticle; that devours the lower surface of the leaf; while a third perforates the stem.—Obedient to its instinct, each individual species industriously contributes its share to the general desolation; and the practical acquaintance with these periodical ravages which has been forced upon the Farmer, has hitherto produced no remedies, or, at best, such only as are partial and uncertain, for an evil so extensive. While the provident housewife industriously destroys the loathsome vermin *(cimex lectularius)* which infest her dormitories, her less persevering spouse, in indolent despair, permits all the residue of the Hemipterous family, undisturbed, to feed on his crops, and then patiently replants, to supply them with a fresh banquet. Content to tread in the footsteps of the ages which have preceded him, he looks at every diverging path with contempt or dismay; and hence it is that, until of late years, improvements in Agriculture have been so much behind the advance of knowledge in every other useful art. This reproach, it is true, bears less heavily on our day than it did formerly. A liberal, intelligent spirit has lately been infused, the tendency of which is to enliven and elevate our system of Agriculture, and to enhance the reputation of those to whose hands it is committed; and of all the occupations of life, which presents a wider or more attractive range to the philosophic mind? Not that we are to expect every tiller of the soil to overleap the adverse circumstances of his condition, and to penetrate and comprehend the numerous processes in the economy of Nature. But the duty, no less than the interest, of every gentleman Farmer—by which phrase is intended, merely, him whose days are not all necessarily required for manual labor—prescribes the employment of a portion of his leisure hours in pursuits and researches which will not fail to invigorate and embellish his practical knowledge. To such we would suggest, generally, the importance of a course of reading in Natural History; and, particularly, of a competent acquaintance with that one, among the most interesting of all its branches, called "Entomology"

—and for such reading we propose to supply the materials, in part, in the "FARMERS' LIBRARY."

Entomology—derived from two Greek words *(entoma* and *logos)* signifying a discourse on insects—treats of the "organization, habits, properties and classification of those articulated animals which are distinguished by the presence of *antennæ* (antenna, a Latin word for *yard-arm)* and of breathing organs, composed of ramified trachea, with or without air sacs." Various writers, from Linnæus to the latest entomologists, have suggested classifications of the insect tribes. The first-named writer classed them from their *wings;* Fabricius from the *structure of the mouth*, and Latreillo from a view of their general organization: Kirby, a more modern writer, adopts the *number of legs* as a basis of classification; while Kollar thus describes them:

"Insects are animals which have a body consisting of one or more divisions; articulated feet; a head conspicuously distinct from the body, on which are placed two moveable horns, called *antennæ*. They breathe through air-holes, which are situated on the sides of the body; the greater number having wings, in their perfect state, and only a proportionably small number are entirely without them.—With the exception of certain groups, all insects have six feet, and their bodies are divided into a head, thorax, and abdomen, by notches or incisions; hence the name *insect* is derived from the Latin word *inseco*, to cut or notch. Before they attain their perfect state, they are subject to various transformations, which are called metamorphoses."

By the researches of these and others who have devoted their time and talents to a patient and laborious investigation of the subject, great additions have been made to the stores of useful knowledge. The science, however, is still in its infancy—a vast field remains to be explored—and it is in the power of the Farmer greatly to aid the entomologist, by observing the minute, but varied and interesting, habits of insects. He would thus inform himself of the periods, the form, and the manner of their appearance; of the plants which are their favorite food; of the modes of their approach, and the parts which they select for their attacks. By adding experiment to observation, he might also obtain a knowledge of their antipathies; and in this way render Entomology more subservient to the interests of Agriculture than it has hitherto been.

It is to this latter point that it appears the proper province of the Farmer to direct the course of this department of Natural History.—Entomologists, lured by the love of research, may well content themselves with the development of such facts as will satisfy the curious philosopher; and, without going beyond this, they have a strong claim to the gratitude of the practical Agriculturist, for whose benefit they have opened the mine of Knowledge, which they offer to him to explore at his pleasure.—From their investigations he may learn that the ravages on the turnip crop are caused, first, by the *turnip flea*, (the *Chrysomela nemorum* of Linnæus,)—a coleopterous* or hard-shelled insect, scarcely an eighth of an inch in length—smooth, shining, and of a brassy color—which attacks the turnip, both in its perfect and larvæ state; its favorite food being the young plant, just as it is beginning to unfold its cotyledon, or cup-shaped leaves—stripping an entire crop with astonishing celerity. The next enemy of the turnip plant is the *saw-fly, (athalia spinarum,)*—so called because the instrument with which Nature has supplied it to deposit its eggs, which is placed at the extremity of the abdomen of the female, on the under side, resembles, in its construction and properties, the saw and auger. The eggs of this fly are deposited on the young turnip plants, from which they emerge into larvæ, with a rapidity which scientific men find it difficult to explain. These larvæ, of a deep black color, as soon as hatched, commence their attacks, which they continue until their full growth, a period of a few weeks, when they drop from the plant among the rotten leaves, and speedily enclose themselves in a cocoon, composed of two distinct layers of silk, out of which it gnaws its way when the fly is matured. Inexplicable instinct is said to teach all insects to weave their cocoon thinnest in the part which is to cover the head, to facilitate the escape of the fly when the time for its voluntary imprisonment has expired. Farmers suffer greatly from the depredations of this insect. Sir Arthur Young states that the loss of the turnip crop in England in one year, by the ravages of this insect, was estimated at $500,000. It has been known to destroy a crop of 200 acres of Swedish turnips, although a belief has prevailed that this species of turnip is comparatively safe from their attacks. The injury they inflict is the consumption of leaves to the stem, by which the plant is destroyed, or the bulb diminished by the obstruction of the vegetable functions.—The *wire worm (ataphægus lineatus)* is another enemy of the turnip plant, which cuts the stem from the root, so that the plant dies on the spot, This insect is the larvæ of chick-beetles, *(elateridæ,)* and is so constructed as to leap a great hight. The larvæ of this beetle, known under the name of wire-worm, appears sometimes, says Kollar, in great numbers, and devastates

* *Coleoptera*, (Beetles,) with six feet, and mostly with four wings, the anterior pair of which are horny, in the form of a covering for the two posterior wings, which are sometimes wanting. They have upper and lower jaws, (mandibles and maxillæ,) for gnawing and chewing; their under wings are transversely folded. Examples: the may-bug, horns, *(ceram bycidæ,)* stag-beetles, ground-beetles, *(carabidæ,)* and weevils.

whole fields of grain. It resembles the well-known *meal-worm*. *Aphides*, or plant-lice, also feed on the turnip plant. Owing to its astonishing fecundity—twenty or thirty generations being produced in a single year—the destruction caused by this insect is proportionally extensive. The fact that at one season of the year they are oviparous, and at another viviparous, is a remarkable peculiarity in the aphides; and one cause of their astonishing increase is, that the sexual intercourse of a single pair, without any reünion, serves for all the generations which proceed from the female during the whole of that succeeding year. The *turnip-leaf miners* are also among the assailants of this plant. One class of these *(dropsophita flava)* bores a gallery under the upper cuticle of the leaf, and is not visible on the under side; while the other, *(phytomyza nigrocornis,)* bred from the under side of the leaf, bores inside of the lower cuticle, and cannot be distinguished on the upper side. Various other enemies exist in the different moths of the Leodopterous order,* all of which, with different degrees of voracity, prey upon the turnip crop.

We have refrained from entering into the minutiæ of the structure and habits of each of these insects, because it would have extended this article beyond the necessary limits to which we are restricted. Enough has been said to show that, on this branch of the subject, the labor and success of the entomologist have shed a flood of light, which develops the path to further and still more useful enquiries. With reference to the *remedies* against these insect ravages—the point to which the interest of every intelligent farmer imperatively urges his pursuit—comparatively but little has yet been effected. Preventives have been suggested in English books, such as keeping the land free from the wild mustard and charlock, which attract the turnip-flea, and from other noxious breeds of insects that feed on the various products of the garden and the field—

> "But chief the forest boughs,
> That dance unnumbered to the playful breeze;
> The downy orchard and the melting pulp
> Of mellow fruit; the nameless nations feed
> Of evanescent insects."

An infusion of quassia, half an ounce to a gallon of water, has been lately recommended in the Gardeners' Chronicle. Sowing in drills instead of broadcast is said to have been found beneficial; and mixing the seed with sulphur has sometimes been of efficacy. Experimental knowledge on this subject is greatly to be desired, and every farmer has the power to contribute his mite to the general store; and apart from this consideration of personal interest, the attraction of the subject itself, when once he enters upon the study of it, will increase at long advancing step. Who can read Huber, Bevan, Gould, and other writers on the economy and habits of the Bee and the Ant, without being filled with surprise and admiration at the irresistible evidence which their system of government, domestic policy and orderly arrangements exhibit, of calculation, forethought, wise division and direction of labor, and unity of purpose?—Solomon had looked into Entomology when he referred the indolent man to the ant for a lesson of wisdom; although it is said to be an error in him and other philosophers, to suppose that the ant lays by a store of provision for winter use, when it, in fact, becomes torpid, and does not either eat or drink during the period of hybernation. What has been taken for food, was only building materials. "*Ce ne sont point des provisions de bouche; ce sont des simples materiaux, quélles font ouvrer dans la construction de leur edifice, comme elles y font outrer des brins, de paille,*" &c. But this discovery detracts from the philosopher, if from either—and not the ant, as it does not lessen the proof of his forecast and systematic industry. Linnæus speaks of the ants milking their cows, the *aphides*, (plant lice;) and Huber describes the process, stating that the ants "not only suck the sweet juice which is constantly passing through the bodies of the aphides, but make use of their attennæ during the operation, to produce a ready evacuation—patting the aphides on the sides pretty briskly," as the calf hunches the udder of its dam. This fact may show that the ant is not the enemy of these hemiptera,* as some have supposed, and that its frequent association with them is of a friendly character. But the most startling facts related by Huber, and corroborated by other writers, relate to the wars waged by one community of ants against another, and the predatory expeditions of the species called *formicans rufescens* and *formica sanguinea*, against the colonies of black ants, for the purpose of carrying off the young for slaves. But they have never been charged with selling their own children to the Turks, as is said to be the practice with a nation that is regarded as physical models of the *human* race. It has been proved by experiment that the rubescent ant has been so much accustomed to de-

* *Leodoptera*—Six feet; four membraneous wings, covered with small membraneous scales or feathers. Instead of the upper or lower mandibles, two hollow filaments exist, which, together, form a spirally rôlled tongue. Examples: Butterflies, moths, and hawk-mouths.

* *Hemiptera*—Six feet, four wings—the two anterior forming hard coverings with membraneous ends, or resembling the lower ones, but being larger and stronger. Instead of upper and lower jaws, the organs of the mouth are formed of bristles, which compose a sucker, and which is enclosed in an articulated sheath, consisting of one piece, of a cylindrical or conical shape, and forming a projecting beak. Examples—the field and tree bugs, house bugs, Cicadæ Aphides. KOLLAR.

pend on the services of the black ant, that it becomes, without the aid of its slave, too indolent to provide or arrange its stores of food, and even to feed itself. The *sanguinea*, however, is more energetic and courageous, and will even protect its slaves and transport them when it becomes necessary to change their habitation.—The tact displayed by the assailants in their invasions of the black colonies, and the defensive arrangements of the latter, are given by these writers with a vividness and minuteness which invest the subject with the charm of a beautiful fiction; and by those not conversant with the study of these insects, it may be regarded as such—for any one but a close observer of insect economy and habits, would declare that such perfection of skill and management is unattainable but by human intellect.

It is worthy of remark that while, against foreign and hostile tribes, ants afford examples of skill and valor in war, in their domestic government they equally inculcate lessons of benevolence and social harmony; for while among some barbarous nations, such as the Africans, it is the custom when one faction gains the ascendant, to sell their rivals in bondage, or, what is worse, exclude them from employment and starve them to death, ants in power never make war on their fellow citizens, but always on a different species. Thus, according to an eminent naturalist, "when one fellow laborer is accidentally wounded at his work, he is assisted by others, and taken to the hospital; but if his case be evidently past the skill of surgery, his body is only then thrown away among the rubbish of the nest."

Into the boundless field of natural history, however, it is no part of the purpose of *this article* to carry the reader further than may suffice to stimulate a thirst after greater knowledge.—To men exempted from the pressing cares of life, gifted with a persevering spirit of investigation, and who have the talent as well as the time to employ in the quiet, close and patient research which it demands, the labor will bring an ample reward in the discovery of entertaining facts and the accumulation of curious and useful knowledge. To such as these the world is a great debtor. All its knowledge of the minuter organisms and various habits of the innumerable tribes of insects which draw their hourly tributes of existence from the vegetable kingdom, it owes to their indefatigable exertions.—The brief view and suggestions here thrown out are solely designed to lead the practical cultivator to that door of the temple of Knowledge which may have heretofore been unapproached by him, and, by opening to him glimpses of the treasures which may be acquired from the application of a small portion of his otherwise unemployed hours, to enable him to protect his crops, in some measure, from the depredations to which they are now annually and grievously exposed—to make the pursuits of Agriculture more attractive to intellectual minds, and to elevate the character and standing of the Farmer in the social scale. By the production of these desirable ends, the whole object of this paper would be accomplished. Still further to promote that end by the relation of anecdotes illustrative of the instinct and the habits to which we have referred, we shall give occasionally interesting particulars with which eminent men have managed to enliven their contributions to Natural History. In the pursuit of this purpose, we solicit the aid of gentlemen whose studies and observations qualify them to aid in giving to the pages of the Farmers' Library, that variety which we desire them to present, but which no one mind, however much more gifted than ours, can well impart.

P S.—At a late meeting of the Farmers' Club, on a call from the Chair for a subject for discussion at the next meeting, a gentleman of varied knowledge and experience expressed his belief that it would take millions—ay, *millions*—to repair the annual losses to the farmer and the orchardist, caused by the *ravages of insects;* and so general seemed to be the conviction of the truth of his impression, that the subject was given out as one of paramount importance, inviting the patriotic and earnest consideration of every friend of rural economy.

Agricultural Inconsistencies.—Prejudice and error generally go hand in hand; a man may be allowed to indulge in obstinacy for his own gratification, but when society is effected by it, the sooner a new light breaks in upon him, the better. I proposed subsoiling my heavy land for beans, so as to admit the action of frost and air abundantly. A demurrer was instantly raised by a farmer present. Oh! we always plow shallow for beans. Well, I know you do. Do you ever double-spit your gardens? Oh, certainly we do. Do you ever grow beans in your garden? To be sure, capital ones. What, and that on double dug ground? Impossible, surely. It would puzzle a conjurer to tell why a farmer always digs his garden 20 inches, and plows his land only 5 inches. Docks, thistles, couch, and other strong deep-rooted weeds, are not to be found in his garden. What reason can a farmer give for drilling his beans at 7 inches in his field and 27 in his garden? Does the former mode give him a larger or earlier produce? Again, a farmer will caution you against sitting in a draught, or lying on a damp bed—of course he takes care not to do so himself; but whilst he practises this for himself, and recommends it to his friends, he pursues an entirely different plan with his cattle. They must be exposed to both; as if their sensations and physiology differed in that respect from our own. Let us keep our cattle warm, dry, and well-fed, and we shall seldom feel the cramp in our pockets.—*I. J. Mechi*, 4 *Leadenhall-street.*
[Chelmsford Chronicle.

CANADA THISTLE.

Published by Lewis & M'Veigh for the Farmers Library. J. S. SKINNER *Edt.*

THE CANADA THISTLE.

We have often heard farmers in the South, lamenting the rumored approach of the Canada Thistle, and expressing a desire to become familiar with its appearance, that it might be met with resolution and vigor on its first arrival among them—it being on its way, like the red fox and other pests, in progress from North to South. The farmer, we conclude, cannot be too soon made acquainted with the "form" and (we will not say the "pressure,") characteristics of an enemy so formidable, that a Pennsylvanian writer, in the Farmers' Cabinet, vol. 2, page 358, says:—

"It has already made its appearance in several directions, to the no small annoyance of the proprietors, and if suffered to remain undisturbed, it will continue to increase until it has taken full and entire possession of the soil, to the exclusion of every other plant, and may be handed down from generation to generation as a permanent legacy. In some of the Western parts of the State of New-York, where it has partially taken possession, you may discover many respectable tillers of the soil reaping their wheat with gloves on, and binding with willows; and some fields may be seen where it has become so thickly set that the owners have given the ground up in despair, as not producing herbage enough to feed a rabbit."

We are advised, by a gentleman who speaks *feelingly* on the subject, and from painful experience, that it may be most effectually destroyed by *mowing it*, when in blossom, before it has seeded, not very near to the ground, and then pouring salt water over each spear of it—but if it be not attacked very soon after it makes its first appearance, it must become very difficult to destroy it by a process so tedious.

Noxious weeds are often spread by great carelessness on the part of the farmer himself in the purchase of his seed. If he *cannot* raise these in all cases himself, he cannot exercise too much vigilance in the purchase of them; and here, again, is an instance of the necessity of always employing as agents and factors, gentlemen of known probity and character, instead of mere upstarts and loafers, who will hold with the hare and run with the hound.

COMPARATIVE VALUE OF DIFFERENT KINDS OF SHEEP FOR THE NEW-YORK FARMER.

A chance interview with that distinguished Wheat-cultivator, General Harmon, of Monroe County, New-York, was embraced recently to obtain his views on some points of Sheep husbandry. He prefers the *Merinos*, for these general reasons, to either the South-Downs, Leicesters, or Cotswolds; and we believe he does not stand by any means alone in his opinions. What follows is the *substance* of his answers to interrogatories:—In the first place he says, that in Western New-York as to the VALUE OF THE WOOL, that Merino, washed on the sheep's back, will command 37½ cents a pound—¾ blood 5 per cent. less—and half-blood 5 per cent. less still; that South-Down Wool will command about two-thirds the price per pound of the Merino; and that the Wool of the Bakewell and Cotswold, being somewhat longer, is rather preferred to the South-Down. Then as to WEIGHT of fleece: that Merinos in his County will average about four pounds; that his lot of pure bloods averaged 4¼ pounds. From a yearting Merino ram lamb he sheared this year 10¾ pounds, and his rams a year old in May past and sheared in June, averaged six pounds. He says Cotswolds will yield a heavier average fleece than either South-Downs or Leicesters. These last he thinks will yield about the same in weight of wool as the Merinos. But he thinks the Merinos decidedly more healthy than the long-wooled sheep, as the fleeces of these last, being more open, will let in the rain and wet to the skin and give colds and consumption. Gen. H. thinks he can get, from the same quantity of grass, as much of Merino as of any other mutton, and that the Butchers tell him the Merinos lay their fat more on the inside—more on the kidneys, where it is more profitable;—in a word, that they "*open better*" than either of the other breeds. We have great respect for the General's opinions; but if any one chooses to "try conclusions" with him, we always stand open for conviction.

FIELD CAPITAL.—The sum required depends exceedingly upon very variable circumstances. The most profitable mode of farming would require the use of £8 to £12 per acre. Eng. paper.

ON THE PRESERVATION OF HEALTH.

THE GOOD EFFECTS OF FREQUENT BATHING.

WITH the mercury at 90 degrees of Fahrenheit, what can be more natural, than to spend a few thoughts on the means of *counteracting the ill effects of such excessive heat!* And how can this be better done than by frequent ablutions of the whole body, so that every pore may be kept open, and free passage given to matter which the system rejects and would fain throw off by perspiration. We write in the full persuasion that bathing is too generally neglected in the country—either from want of thought upon its importance, or want of convenience for its enjoyment; but with a little trouble such convenience might be provided, wherever there is a good pump, or yet better, where there is a copious spring of water. The facilities should not only be afforded, but those who have charge of families should make it a point to see that they are availed of, by every member under his control. Ask the laboring man, him who labors with mind or body, and who is accustomed to being daily, or very frequently refreshed with the shower or plunging bath, what would induce him to forego it?—Rising in the morning exhausted and languid from the effects of oppressive heat, he comes out from his bath invigorated and capable of thinking so much closer, and working with so much more alertness and satisfaction that he would much sooner relinquish one meal a day than *give up his bath!* He only who habitually enjoys it can estimate the privation when no means are to be had for the indulgence.

Those who have most studied the art of preserving health dwell upon *cleanliness of the person,* as next in importance to be considered after *air and food.*

The happiness and success of every farmer, depends so much on the health of all his household that under the most fervid heat that has been felt here for the last ten years we do not see that we could better devote the space it occupies than in giving to his perusal and reflection the following paper which seems to contain about all that need be said on the subsubject of it:

"This is not a mere matter of decency. It is one of the positive commands arising from the constituted order of things. Be it remembered, that every thing that lives, vegetable or animal, is wasting while life continues; and that all which is sent forth through the milllions of openings by the skin, has run its round, and is lifeless; and that more than half of all the food taken comes forth in this manner. If perspiration, sensible and insensible, be permitted to rest on the skin, and stop the way of that which is coming, Nature is offended, and will show that she is so. Such neglect is one of the causes of disease. This fact was probably well known to Eastern nations, since it was part of their religious dutiy to cleanse the skin. These nations were ignorant of the modern comfort of wearing a garment next the skin which can be frequently changed. The absence of this comfort was one of the causes of those dreadful diseases of which we read, and which are now unknown among Christian nations. There are classes of laborers and mechanics, whose health would be preserved, and their lives prolonged, if they knew how much depended on periodical cleansing. It may be said that there is a connexion between cleanliness and moral feeling. Perhaps it may be going too far to say, that those who habitually disregard cleanliness, and prefer to be dirty, have no moral perception: but it may be truly said, that those who are morally sensitive are the more so from respecting this virtue. There is a close affinity between moral depravity and physical degradation. The vicious poor are always shockingly filthy: the depraved rich are visited by worse penalties: they may have clean garments; but what can wash away the impurities which vice has made a part of themselves? It is not for one's self only that the virtue of cleanliness commends itself. Every one comes within the observation of others. However uncleanly one may be himself, he is not the less offended at the like neglect in those whom he observes. Now, it is every one's duty to himself to recommend himself to others, so far as he innocently and reasonably can, and to obtain their respect.—Clean and costly garments may fall very short of doing this, if it be seen that they are a covering for the neglect of this important law. If there be a lovely object to the human eye it is a clean, clear-faced, healthy, innocent, neatly-clad, happy child. There are few children who may not, if they will, be neatly dressed. for this does not depend on that of which the dress is made. There are fewer who may not have a clear skin, and healthy look, if they are properly fed, and sleep in pure air. There are none who may not have a clean skin; for we speak to those who are old enough to judge for themselves. And let it be added, for their inducement, that, in obeying the command to be clean, they are performing a moral duty; in neglecting it they are inflicting an evil on themselves in two ways—first, in diminishing their own comfort; second, in losing the esteem of others."

☞ The best mixture for filling up wounds in trees is made with cow-dung 1 bushel, old lime-rubbish ½ a bushel, wood-ashes ½ a bushel, and a little river-sand, well worked together by spade, or beaten until it is of the consistence of fresh plaster, such as is used for ceiling rooms.

THE CAUSE OF EDUCATION

AS CONNECTED WITH AGRICULTURE IN THE SOUTH.

LETTER FROM THOMAS AFFLECK, ESQ. CORRESPONDING SECRETARY OF THE NATIONAL INSTITUTE, TO THE EDITOR OF THE FARMERS' LIBRARY.

* * * * "I am desirous of having all the information possible, on the subject of the establishment, progress and present working of the Free School system of New-York and Massachusetts. We do indeed need something of the kind here; and I am in hopes that something can be done now. The first important step has been taken. A liberal and public-spirited gentleman of Natchez, Alvarez Fisk, has brought the subject directly home to the people of that city, by giving to the city a valuable property, with good and sufficient buildings upon it for extensive Free Schools, on condition that the citizens should immediately consent to the levy of a direct tax upon themselves for that purpose. At a public meeting immediately called, this was voted for almost unanimously, and a tax levied sufficient to establish and support an extensive Free School of the very highest character, which it is expected will be opened in a few days.

Those of us in favor of a general and extended system of Education, within the reach of and free to all, are now greatly encouraged to hope that the examples set by the cities of New-Orleans and Natchez, will be followed by the *States* of Louisiana and Mississippi.

The subject of Home Education is attracting much more attention within the last year than it has done for many years past. Parents begin to see the bad effects of sending their children so entirely beyond their reach, as they are when sent to Schools and Colleges in the North and West; and particularly lads of an age to receive readily impressions of idleness, and iniquity of every kind. They begin to find, too, that those young men who have received an education at Schools and Colleges near home, get a much better education than those sent abroad; and from the check kept upon them by parents and friends, almost invariably turn out better than when left to themselves. The additional support now given to our institutions of learning, enables those in charge of them to extend and improve their means of usefulness—and I venture to say, that the young of both sexes of this State can now receive a better education at home than they can by being sent a distance. Our own little town here, of Washington, has a most excellent High School, conducted by Messrs. Ammen & Rowland, (the former well known as an excellent instructor and disciplinarian, and whilom Professor of different Colleges)—and an equally excellent School for young ladies, the old, well-known Elizabeth Female Academy, now under the conduct of Mr. and Mrs. Ford and their daughters, formerly of Germantown, Pa. Both these Institutions, as also Oakland College, are in a very flourishing condition.

I am glad to see that you once more ascend the Chair Editorial, and are about to give us a new Agricultural Journal. Success attend you!"

We should hail this letter from Mr. AFFLECK with more pleasure, and with greater confidence in the prospects it bespeaks for the South, if we could be satisfied that he does not mistake his own enlightened enthusiasm for a well-rooted public sentiment, and a firm determination to *act*—for every one knows the wide difference between *doing*, and—*having a great mind to do!* How often have we heard the notes of preparation for reform, in the systems of education, and in the agricultural practices of the States South of the Delaware, yet how little has been achieved in either since the Revolution of 1776! As far back as 1692, more than one hundred and fifty years past, at a session of the Legislature of Maryland, held at the *City of St. Mary's*, an act was passed for the encouragement of education. Four years afterwards the Free School of "King William" was established at the venerable City of Annapolis, and in 1723, more than one hundred and twenty years ago, a school was erected in each of the twelve counties, into which the State was then divided, and the funds provided by previous acts, for the support of County Schools, was equally divided among them. By various acts of Assembly, schools have since been established in all the counties subsequently formed; but what have any of these schools done for imparting a knowledge of the *principles of Agriculture*, or any of the sciences, the knowledge of which is necessary to ensure to practical agriculture greater success and higher intellectual embellishment? In these schools have been taught, time out of mind, reading, writing, common arithmetic, and sometimes the *Latin* and *Greek* languages; but, what particular light have these shed on the business which was to be pursued, as a profession and for a livelihood, by four-fifths of the scholars? The mistake has been, not in any want of sensibility to the importance of common schools, so that education may be brought to every man's door, (though that has been but partially effected,) but it has consisted in not providing for the *right sort of education*.

On this subject, it would be difficult to say any thing that *we* have not urged again and again, years ago. More than twenty-four years past, it was said in the American Farmer—on the *Profession* of a Planter or Farmer, that "a

farming, planting and horticultural collection of books, should adorn, and would enrich every cultivator's mansion. An intimacy with a few such works during the five years preceding the time of lawful age, would alone be enough to make a respectable man, of honorable acquirements, out of a raw and simple youth of sixteen years. The human mind is as susceptible of being trained, quickened, strengthened and led to a right end in the great *business of the Planter and the Farmer*, as in *any other* profession in the whole round of human life. Every thing is done with more than a medium profit, which is done by *a skilful mind*, added to mere animal strength. Education not only forms the common mind; it forms those minds also which are uncommon. To be taught the habits of observation, examination, and reflection, and to attend to *causes*, consequences, effects and results, is to be a man of better sense however good the mind may have been by nature- The *Farmer or Planter ought to be that man, that master, of his art—sub arte peritus*—as well as his neighbors in other professions. Affected by the seasons and the weather, he should be a careful and judicious observer of them."

"The cold nips his productions in the germ and bud: the heat prevents their succulent nourishment: the wet occasions injurious fermentations, or retards maturity till the season is lost. The instructed and experienced farmer best applies the proper means of prevention, preservation, and cure, which the various trials of the day require from his vigilance and versatility. Warned and empowered *by knowledge*, he saves by the ability to act instantly with intelligence, while a half bred farmer loses the quality or quantity of his crop from delay to consider or inquire. From the moment when an able cultivator sets apart his fields for the several purposes of the year, till his crops are delivered to the purchasers, he is engaged in a round of observation, care, management, and an acquaintance with his profession by a regular and well governed education, must give him an incalculable advantage over an industrious but untutored neighbor in the quantity, quality, and value of his crop."

Bear in mind, my dear Sir, that these thoughts were presented to the patrons of my old American Farmer in 1821—and here, after a lapse of twenty-four years, what progress has been made in practical education in the Southern States? Is not their course of education the same now as then—the same old books and methods? Compare their products and exports—their population and general condition and prospects now with what they were then, and wherein have they advanced? Is there, then, as some would persuade us, some resistless enervating influence in the air of Southern climes that unfits men to struggle continuously, and at last turn back those adverse tides that occasionally threaten to break over the prosperity of every community?

Unmanly thought! what seasons can control,
What fancied zone can circumscribe the soul?

And here let us say, by way of parenthesis, when we speak of defective education in the South, we are not to be understood as meaning that sort of education which makes men classical scholars and orators, and passionate and powerful declaimers—we forget not and can never cease to admire her Pinkneys and her Randolphs—her Madison and her Henry. "Thoughts that breathe and words that burn" are spontaneous growths of Southern soil. nor can we too highly estimate their value, when the flame of patriotism is to be kindled, and grave Senators to be animated in the cause of liberty, by a Calhoun or a Preston, a Rives or a McDuffie, or a Berrien—but is there not a time for all things—a time and subjects for *action* as well as for speaking?

As to the causes which seem to have suddenly arrested the growth of the Southern States—the grain growing States more especially; bringing them to a stand still, as the noblest buck of the forest sinks in his tracks at the crack of a Hampton rifle—some attribute their unimproving social and pecuniary circumstances to some baleful political influence, under which labor-saving machinery has been introduced, to increase proportionably the productive capacity of the North. Prior to the great improvements in machinery for the manufacture of textile fabrics, Virginia had, probably a larger number of hand-looms at work than any equal population, but what natural facilities for manufactures does the old Bay State possess, that the Old Dominion does not enjoy? With this advantage in favor of the latter, that she might supply from her own soil, under its genial skies, what Massachusetts buys from other States of the necessaries of life, and chiefly from the South; amounting to a quantity, in the article of wheat flour, for example, to nearly, very nearly all our exports to all the world besides. Instead, then, of struggling against destiny, is it not better to control and meliorate it? And is it not of the greatest importance to all who have agricultural surpluses to sell, that their customers should be as near as possible to the place of production, lessening in that proportion the expense of transportation which is levied on the produce; for, as Mr. Stevenson has put it, with clearness and force—

"Our produce, until it reaches the market of exportation, does not change its character of interest. It is still the planter's, and only becomes an article of commerce, when it touches the hand of the merchant. The transportation, therefore, to market is as intimately connected with its value as any process of its previous preparation."

But let me not be led away, in *this* letter, from the subject of the *sort of education* best adapt-

ed to the wants and condition of Southern agriculturists; and here again, to show not only what my views are, but that they so remain after years of reflection, let me recur to the American Farmer for 1821. If I dwell more than may seem necessary on a single point, it is because I verily believe that in no other way but by a radical change in the books used and the subjects studied, and, in a great measure, in the qualification of instructors, can thorough reform and regeneration for the Southern States be brought about—we must begin by instructing those, thoroughly, in the true wants of agriculture, and the true *principles of the practice* of that art, who are to come after us, and to frame the laws and policy of these States. But first please turn back to Mr. Randall's important letter, page 44 of the July number of the Journal of Agriculture and see how, twenty-four years ago, his suggestions were shadowed forth in the following from the American Farmer of 1821; and how, as evinced by his letter, the ideas then thrown out, are *approaching their consummation in this State*, where there are now *more than eleven thousand common school districts, and more than* 650,000 *scholars*—though then there were not half that number. Shooting ahead of Virginia as one of Stevens' flying steamers passes a sloop on the Hudson, what will New York not do, when, a few years hence, their *million of scholars* come to be educated in the way, and imbued with the sort of knowledge here recommended:

"Since the happiest experience has proved that the cultivators of the earth may be as opulent and illustrious as *Washington*, let us proceed to inquire into *the means* of making us a people great in the *profession* of agriculture; intelligent in its theory, bright in its practice.

The foundation of general education is laid in the common schools of the townships, hundreds, parishes, villages, boroughs and cities.—We will denominate those schools for reading and writing *the primary schools*. From the natural equality of men, these schools must contain the same proportion of sound and strong minds as our academies, colleges and universities. In these little scenes of puerile instruction, teachers should be preferred who have a talent and knowledge in farming, fruitery and gardening. They should have a suitable *teacher's glebe*, as part of their support, and for the exercise of the industry, talents, care and management of the children. The teacher should study to instruct them in the practice, course, and *reasons* of culture. He should have *a manual of the farmer's profession*, out of which portions should be read as exercises, It would be worthy of the wisdom of the State Legislatures to offer a premium, in money, to such persons as should compose and compile *the best hand-book*, for that purpose, which should be printed in a plain, cheap volume for those schools, and for the families of planters and farmers, male and female. Women are often distinguished in gardening and fruit, and are respectable in the economy and management of a farm. Cuts or plates, exhibiting "*the mechanic powers*," the lever, the wedge, the inclined plane, the screw, the pulley, with their uses, advantages, and reasons, or principles, would be highly amusing and deeply instructive.* Competition, in little sections of the teacher's ground, as to kinds, qualities, and quantity, would have an excellent effect. Every parent or guardian would cheerfully supply his child or ward, with seed for his little section of the teacher's ground. Approved tools should be a subject of particular consideration. Whenever ground could not be obtained, or cultivated, such a book as has been mentioned, would be highly favorable in its effects upon young minds, and most so in the cases of the children of the ignorant, the unskilful, the poor and the unwise.

The neighbouring heads of families should send to the teacher a constant supply of articles on agriculture from newspapers and pamphlets, specimens of fine wool, or curious seeds, fruits, plants, engravings, tools, implements, utensils, ores of lead, iron, copper, tin, &c. clays, ochres, new improvements, processes, inventions, &c. &c. as they might fall into their hands from time to time. After securing one for himself, every planter and farmer should send one to the teacher. These two effects would be produced, the teacher and the pupils would acquire a variety of useful knowledge *pertinent to culture*, never to be forgotten, and the pupils would carry it home to their fathers and relations, and thus diffuse knowledge, and increase its activity, at least among the uneducated.

In the next class of schools above the common or primary, and below the colleges, which we call in America, *Academies;* the same means may be used to excite to agricultural instruction, reading, observation and reflection. It may be done in a more accurate, systematic and extensive manner. Dictionaries of agriculture; concise systems, Dictionaries of the branches of art and science connected with culture, may be easily and cheaply introduced. The superior professors would be warned on the subjects, by *the opening* of it, proposed in the common or primary schools, and assisted by conferences and correspondence, with the most powerful men among the practical farmers and planters of their vicinity and acquaintance. The best American and foreign writers may be consulted, and the branch of *landed culture* in our academical *economics* may be rendered delightful, ornamental, beneficial and accurately technical and sci-

* Two Indian warriors were shown a beautiful pair of compound brass pulleys, in the college of Philadelphia. Each block had perhaps a dozen sheaves, and was about as large in circumference as a common tumbler, and capable of receiving only a good silk bobbin of the thickness of a tenth of an inch.—The two stout red *children* of nature were told by the interpreter, that a little boy then before them, would force them, *by those pulleys*, to come together. Each seized one of the double blocks by the hooked metal handle, and stood at a distance from the other, of about three or four feet. The little boy began to draw the cord, and forcing the Indians to approach *by the power of the pulleys*, the Indians, with a little passion on their faces, set foot to foot against each other, and endeavored to keep apart. The child, who was instructed, pulled upon the string, and laughed archly. The Indians struggled, with violence and rage, using all the force of their arms, legs, and weight to keep apart, but to their great mortification, were brought together, with the scotched blocks of those powerful little pulleys. No pupil in the college library, no savage of a dozen there ever forgot that practical lesson upon *the power of the pulley*.

entific. Annual, quarterly, monthly or weekly discourses of teachers and exercises of pupils, happily mixed, might be practiced. A regular compendium for the exercises of the pupils, is as easy, and proper in this branch of economics, as in those relative to money in coins, money of account, commerce, government, &c. They are all embraced in the enlarged system of moral or habitual or customary or practical science of the economy and business of human life; which is strictly "*moral philosophy*" or "*moral science.*"* It must not be apprehended, that these ideas are too formally learned and scientific for the business of farming, for it is a truth, that it is the real, simple and valuable character of the present times, that the commonest things are no longer done by guess, by mere practice, fashion, custom or imitation. It is known, that there are philosophical principles and technical processes for boiling *spinach*, making *butter, cheese, soap and bread*, constructing *a spinning wheel*, or *loom*, making *maple sugar*, fermenting home-brewed *ale, cider and wine*, distilling *spirits*, as real, true and sure as the principles on which the Almighty Maker of all things has created and ordained the motions of the spheres that roll throughout the universe. *Genuine Philosophy*, in its correct sense, is the whole system of principles on which God has made, preserved, and applied every thing from the atomic dust of the balance to the stupendous luminary of the universal frame. *Our philosophy* is all we know of this immense mass of divine wisdom; and it may be safely affirmed, that *the profession of a planter or farmer* rightly understood, involves more of its *temporal* materials, than any other single pursuit in life, not even excepting that of the learned Doctor in the healing art.

It will naturally follow from what has been advanced, in regard to our common or primary schools, and more reputable academies, that *the infusion of a knowledge of the principles and arts of agriculture into the minds of the pupils in our colleges and universities arises as the next duty, and in a superior degree.* It is by means of the learned professors, the excellent books, in the routine of instruction, and the invaluable collections, which fill their libraries, that the maturing student elevated by means of the two lower schools, may search into the whole round of our subject. He may thus obtain the best modern and tried knowledge of the earth, its theorists and its operators, its cultivations, its seed, its productions, its miscarriages, its methods of prevention, support and cure, and all its scientific and technical instruments, means and auxiliaries. Here, too, the professors and the students may perform the delightful task of exemplifying all the science relative to agriculture, in the various crops of the neighbouring estates, preparing the youthful minds for the next and most important stage of their juvenile instruction.

It is now proposed to submit a proposition, which may appear new, or at least not to be yet practiced in the United States.

It appears expedient to adopt in the education of our sons for *the profession of a planter or farmer*, a measure which is common and approved in every other walk of busy life. The youthful pupil in the ministry of religion is placed by his parent or guardian, as a regular student of divinity, under some suitable established minister, of talents, learning, and virtue. The pupils of the law and in medicine are placed in similar situations, with established practitioners of talents, learning and probity. Young men intended for the profession of architects, masons and other branches of the fine and useful arts, are treated in the same judicious and faithful manner. If *the profession of the planter or farmer* is to be rendered *more profitable and distinguished for talent, improved by knowledge and experience*, it is obvious that a like measure, in the last stage of the education of the rising generation, intended for rural life, is worthy of further serious consideration."

We would proceed to enumerate the several branches of Agricultural industry, which might be pursued with increasing powers of illustration, and intellectual enjoyment, as well as with greater practical success, (embracing the pursuits of cotton and sugar planting)—after an appropriate course of scholastic preparation; and might explain more exactly in what that preparation should, in our humble judgment, consist; but that as much space has been already occupied as it would be fair to appropriate to one subject. It may be reverted to in the September number, in the hope, not so much of submitting anything new, as of enforcing by additional illustrations views already urged and which seem to be indispensably necessary to insure the common aim.

Thinking thus that so much depends on practical education, it becomes a cause in which we should never tire of being useful, if we could; for we believe it to be as true now, as it was in his day, when two hundred years ago it was quaintly written by Fuller:

"'Tis a silly conceit, that men without the dead languages, are also without understanding. It's apparent in all ages that some such have been even prodigies for ability; for it's not to be believed that Wisdom speaks to her disciples in Latin, Greek, and Hebrew."

Sure it is, it was in neither of these languages that she spoke to our WASHINGTON or FRANKLIN.

For the present you will be pleased to pass from this to page 97, in which will be presented an inkling of what science and what societies are doing for Agriculture in England. Though nothing can be more unsafe than to follow English practices in detail, without reference to obvious dissimilarities, yet the general principles of agricultural improvement are of universal applicability. J. S. S.

☞ Don't allow Rhubarb to seed if you want very fine leaves next year. The roots, if left in the ground, will require no care; if forced, it is only necessary to transfer them from the open ground to a warm and rather dark greenhouse.

* Moral science does not mean mere *ethical* or *virtuous* science; but the science of the whole system, or economy of civilized life, from the rules and operations of families and men of business in every line, to those of corporations, states, governments, and nations.

AGRICULTURAL ASSOCIATIONS AND SCIENCE.

WHAT THEY ARE DOING FOR AGRICULTURE IN ENGLAND.

THE "ROYAL AGRICULTURAL SOCIETY" of England met at the Society's House, Hanover Square, London. 21st May, 1845—Duke of Richmond, President. One of the points to which the Society's attention had been directed the last half year, was—a *chemical analysis of the ashes of plants grown on different soils, and in different localities, throughout the kingdom.*

That Society now consists of 96 life-Governors: 204 annual Governors; 495 life-Members, and 6123 annual Members, making a total of 6,933 Members. It appears from the statement of arrears that, on the 1st day of the present month, 35 Governors and 2,281 Members were in arrear of subscription, the sum amounting to £5,730; that at the General Meeting in December last the amount of such arrears stood at £6,609, a reduction of £879 having been effected during the last six months. The present amount of invested capital is £8,200—a purchase of £500 stock in the 3¼ per Cents. having been made during the last month. The current cash balance in the hands of the Society's bankers at the present time is £2.038, not including the sum of £1,000 contributed by the town of Shrewsbury, towards the expenses of the ensuing Country Meeting, and already paid over to the credit of the Society's account.

To show the grand scale on which these associations for the improvement of Agriculture are conducted. a few items may suffice.

It has been seen that the town of Shrewsbury gives $5,000 for the sake of having the ensuing County meeting held there.

"At the suggestion of the British Association for the advancement of Science. the Council have resolved that a chemical analysis of the ashes of plants, grown in different localities and on different soils throughout the kingdom, shall be made at the expense of the Society; and they have voted the sum of £350 towards carrying out that desirable and important object."

Here, then, it appears that for a chemical analysis of the ashes of plants. they appropriate near $2,000! What State in this Union, even in its corporate capacity, and out of its public treasury, would give that much to have even a complete geological survey of any one, or of every county in the State? Whereas *every county* ought to be surveyed geologically and agriculturally. Then again—

"At the request of the Stalham Farmers' Club, the Council have instructed *their consulting chemist,* Dr. Playfair, to analyze, at the expense of the Society, specimens of the soil and subsoil of a wheat-field in Norfolk, remarkable for its productiveness."

Who shall say, after this, that Agriculture has no need of the lights of science? Here they have a regular "consulting Chemist," who is probably paid four or five thousand dollars a year. True, these members of the Royal Society of Agriculture are men of immense income, but it consists also of men of distinguished ability, who, in all their proceedings, indicate a confidence that agriculture *under the application of chemical and mechanical science,* is in the full progress of successful improvement.

Look now at their list of premiums—in respect of its tendency, particularly, to excite inquiry and to insure the application of intellectual (the best of all) power to Farming concerns! In our country we are too apt to doubt whether Agriculture is to be improved by any thing but early rising and hard work; and when we do call on men whose science is the fruit of years of toilsome study, we expect them to give their time for nothing, and take reluctant thanks for pay! Sometimes, when employed by the State on a small salary to make scientific explorations, demagogues soon persuade the people, or rather their popularity-hunting representatives, that it is money thrown away. Here, in the case before us, $200 are given in many instances for a single report on the farming of a particular District. What would the Agricultural Society or even the State of Virginia give for a report on the farming practices and improvements—Grasses, Manures, Implements, Domestic Animals. Management of the Dairy, Sheep Husbandry, &c. &c. of any, the most thriving county in the United States? When we speak of Virginia, though seemingly in a tone of reproach, it is always in a spirit of (we were going to say, of overweening) affection. If we instance her, we generally mean as much, Maryland, North and South Carolina, Georgia, Alabama, and all the old grain-growing and planting States South and West of Delaware. But to return to the list of premiums awarded, look at them in the light we have already indicated! It will be seen that these do not embrace but are over and above the thousands of dollars given for best implements and animals—cheese and butter, fruit and poultry. They are all for the written results of

philosophical or practical inquiry, and observation—in a word for *exercises of the mind*, brought to bear upon the practical every-day concerns of the working Farmer.

Countless are the benefits and blessings derived, every day, by the plain, practical working man, which, without his being aware of it, and even while he is deriding the thought of it, are the legitimate fruits of scientific discoveries made by men, in many cases, who never ran a furrow or planted a seed of cotton or of corn in all their lives. But this is a theme worthy to be separately dwelt upon and illustrated when we can get time.

The Journal Committee have reported the following awards to the authors of Prize-essays, and schedule of the subjects of Prizes, amounting to £310, for the Reports and Essays of next year:

AWARDS.

The Prize of 20 sovs. [$96 80] to Mr. H. White, of Warrington, for his Essay to the Details of making Cheshire Cheese.

The Prize of 50 sov. [$242] to Mr. R. W. Corringham, of Bolham Hill, near Retford, for his Report on the Farming of Nottinghamshire.

The Prize of 50 sovs. [$242] to Mr. W. F. Karkeek, of Truro, for his Report on the Farming of Cornwall.

The Prize of 50 sov. [$242] to Mr. G. Buckland, of Benenden, for his Report on the Farming of Kent.

The Prize of 20 sovs. [$96 80] to Mr. J. Watson, jun. of Kendal, for his Essay on Reclaiming Heath-land.

The Prize of 10 sovs. [$48 40] to Mr. E. Bowly, of Cirencester, for his Essay on the Advantages of One-horse Carts.

The Prize of 20 sovs. [$96 80] to Mr. J. Grigor, of Norwich, for his Essay on Fences.

The Prize of 10 sovs. [$48 40] to Mr. G. Dobito, of Kirtling Hall, Newmarket, for his Essay on Fattening Cattle.

The Prize of 20 sovs. [$96 80] to Mr. F. W. Etheredge, of Park-street, Westminster, for his Essay on the Cheapest and best Method of Establishing a Tile-yard.

The Prize of 20 sovs. [$96 80] for an Account of the Best Experiment in Agriculture, to Mr. J. Hannam, of North Deighton, near Wetherby, for his Essay on the Theory and Application of Bone-manure.

Be it not supposed that we are holding up these Proceedings of the Royal Society, either for hopeless emulation, or invidious comparison. The object is to gratify a natural curiosity on the part of our readers, and of *our* Agricultural Societies, to see what is doing in a country where art has done so much for the plow—moreover (we confess the soft impeachment) we would commend the *quo animo* of these proceedings especially in as much as they indicate a strong persuasion among the most enlightened men in old England that mind—thought—reading—philosophical and politico-economical investigation, have something to do with, and may lead to improvements in *farming*, as well as in Law, Physics, Mechanics, Manufactures, Commerce, Ship-Building and Salt, Sugar and Iron making!!

The following is the schedule (referred to above,) of the subjects for which the next Premiums of a similar class are to be awarded:—

SCHEDULE.

	£
On the Agriculture of North Wales	50
On the Agriculture of the West Riding of Yorkshire	50
On the Agriculture of Cambridgeshire	50
On the Advantages and Disadvantages of Breaking up Grass-lands	50
On the Improvement of the Condition of the Agricultural Laborer, as far as it may be Promoted by Private Exertion, without Legislative Enactment	30
On Keeping Farm Accounts	10
On Employment by the Piece	20
On Peat-charcoal as a Manure	10
On Sulphuric Acid and Bones	10
On White Mustard	10
On St. John's Day Rye	10
On Draining Running Sands	10

"The Council have received from the Journal Committee a highly favourable opinion of the character of the Essays sent in this year to compete for the various Prizes offered by the Society."

We propose to skim, for the patrons of the Farmers' Library, the cream of these and all other Essays where the matter may be calculated to shed useful light on the path of American Husbandry.

"The Council have accepted the invitation of a public meeting, convened at Newcastle-upon-Tyne, to hold the Country Meeting for the Northern District, at that town, in the year 1846."

We are under the impression, that the Town which gains the favor of having the yearly meeting and exhibition held in it, is required to subscribe $5000. UTICA, we doubt not, will do the handsome thing, in the way of arrangements for the Fair next Autumn. We hope the State Society will employ a good proportion of the funds at its command for *best essays*, that shall best explain the *principles* of farming practices and machinery. Such practical essays as Mr. THOMAS's, published in the last number of the Farmers' Library, and such as a very able and scientific one from the polished pen of DOCTOR GARDENER, which we have been kindly permitted to peruse; are calculated to do more good than the exhibition thrice repeated of all the fat animals in New York—useful as that is in its way. May we hope for the influence of the new "State Agricultural Society of Virginia," in the 'establishment of *local societies* for the discussion of Agricultural subjects" as has happened under the auspices of the National Society in England?

At the meeting here referred to, the Secretary, whose official conduct was on all sides applauded, offered his resignation on the ground that his *two thousand dollar salary was inadequate!*

"The Council, in conclusion, have the satisfaction, at the close of the 7th year of the establishment of the Society, of congratulating the

members on the steady advance of the Society in the accomplishment of its various practical objects, and the gradual development of its prospects and resources: among which the Council cannot help alluding to the establishment of local societies for the discussion of agricultural subjects, which they feel have mainly originated from the attention which the exertions of this Society have attracted to the improvement of agriculture, and which the Council are confident will lead to the most beneficial results."

We will see in the September number what is doing, in the same spirit, in SCOTLAND.

DRAINING TILE.

WITH commendable vigilance and attention to the wants of Agriculture, and the various expedients and inventions to supply them, the New-York State Agricultural Society has offered a medal for the "*Best sample of drain-tile.*" This justifies the presumption, that under certain circumstances, that article may be profitably employed in our country, and thus the whole economy of the question is opened for the consideration of those who may desire to avail themselves of it, in conducting one of the most important processes to which a farmer can have recourse, for augmenting the productiveness of his estate. The more important and worthy of being employed, when the farmer can possibly command the labor and the means of carrying it out, because, generally, it would be made instrumental in giving activity to the very portions of his farm, which, but for their superfluous moisture, would be the most productive—not only the most productive, as respects actual fertility, but *profitable*, as it prepares such portions to yield crops of a kind that demand the least amount of labor to husband them.

As in some measure illustrating a subject which seems thus to have attracted the countenance of the best organized and efficient society in the Union, we have chosen the following from the last number received of the Journal of the Royal Agricultural Society of England.

This is one of those cases not to be much, if at all, affected by obvious and admitted difference of climate; the propriety of the measure depending rather on general principles: in a word, to be regarded merely as a question of means and end—of profit and loss. We give a cut of the machine, such as we find it in a late number of the London Agricultural Gazette, where the advertiser refers to the communication here inserted. It will take an eye of quicker perception of the principles of machinery than ours, to understand the construction of this one; but it was deemed best to give it such as it is, along with what follows:

ON THE CHEAPEST METHOD OF MAKING AND BURNING DRAINING TILES.

To the Earl Spencer:

MY LORD,—The active interest you have so long taken in every thing connected with British Agriculture, induces me to address to you the following communication on the subject of making and burning draining tiles, of whatever form, in the readiest and cheapest manner.

My attention has been very forcibly drawn to this subject by the high prices demanded by the manufacturers of these indispensable instruments of agricultural improvement, prices indeed so high, that even without the expense of carriage, they must have the effect of confining within comparatively very narrow limits their adoption.

It is true that the application of machinery to the producing of draining tiles, promised, and in some degree effected a reduction in the price of tiles previously made by hand, but owing to the mistaken views of those who worked these inventions, in fancying they could secure a monopoly of machine-made tiles, in requiring a seignorage on tiles made by their machines, and in the high cost of those machines, they offered the tiles to the public at so high a price that it soon became evident, if draining tiles were to be used to the extent required throughout the United Kingdom, that some other machinery of a less costly description, with equal, if not greater powers of production, and with unfettered liberty of using it, would be discovered—and this result has accordingly taken place. Two machines, worked by hand, have been discovered in the course of this year, viz. "Clayton's Machine," which is a fixture wherever set up, and for which a patent has been taken out; the other called "Hatcher's Machine," easily moveable, and manufactured and sold by Messrs. Cottam and Hallen, Winsley-street, London. The latter machine is the invention of Mr. John Hatcher, brick and tile maker and potter, living in the parish of Benenden, in Kent, where I reside, and is the one I have adopted; and all the subsequent calculations and quantities are made in reference to the producing power of that machine. I beg to assure you that, as my sole object is to put the public in possession of the readiest and cheapest way of obtaining these tiles, if any other machine as yet discovered could make them better and cheaper, I should instantly adopt it, as I certainly shall if any such be hereafter invented; and it is quite certain that the public will apply the only real test of merit to these machines in determining their choice of one, viz., the cheapest rate at which tiles can be produced by them, taking into account the price of the machine, the amount of labor necessary to work it, the goodness and the quantity of tiles it can produce in the day, and the simplicity of its construction.

Being fully aware that Hatcher's machine was not excelled by any other yet discovered in all these essential points, and therefore assuming that machinery had accomplished much, if

not all that could reasonably be expected from it, I still felt that the heavy expense of erecting kilns, as they are now constructed, together with the necessary sheds and other buildings incidental to a regular brick and tile yard, required so large an outlay, that the price of draining tiles would still continue too high for universal use, notwithstanding every improvement in the mechanical production of them. To this difficulty another must be added, no less serious, in attempting to reduce the price of tiles, viz. the expense of carriage of an article so bulky. Every one must be aware that beyond a certain distance from every brick and tile manufactory (unless it stands on the bank of some navigable water,) the expense of carriage of tiles will impose the limit of their application to land drainage. What, then, is to become of those immense districts in the United Kingdom that are so situated? It will not much reduce the evil to incur all the heavy expenses of erecting kilns, sheds, &c. &c. after the usual manner; for interest on capital embarked in the business, together with rent, must be added to the cost of making them; and after all, *if the object be to make draining tiles only*, it is obvious that these buildings of a permanent and expensive character will become useless, whenever the circle around them is furnished with tiles, the extent of that circle being always determined by the expense of carriage beyond it.

Reflecting on these obstacles to universal drainage, where required, I conferred with Mr. John Hatcher on the possibility of erecting a kiln of common clay, that would be effectual for burning these tiles, and of cheap construction—and the result was the building one in my brick-yard in July last, and the constant use of it until the wet weather at the commencement of this winter compelled its discontinuance, but not until it had burnt nearly 80,000 excellent tiles; and in the ensuing spring it will be again in regular use.

I shall now proceed to take in order the six points enumerated under the 9th head of the Prize Essays for 1845, as printed in the last volume of the Royal Ag. Society's Journal, viz.:—

1st. Mode of working clay according to its quality.
2d. Machine for making tiles.
3d. Sheds for drying tiles.
4th. Construction of kiln.
5th. Cost of forming the establishment.
6th. Cost of tiles when ready for sale.

1st Point. Working the clay.

All clay intended for working next season must be dug in the winter, and the earlier the better, so as to expose it as much as possible to frost and snow. Care must be taken if there are small stones in it, to dig it in small spits, and cast out the stones as much as possible, and also to well mix the top and bottom of the bed of clay together. It is almost impossible to give minute directions as to mixing clay with loam, or with marl when necessary, for the better working it afterwards, as the difference of the clays in purity and tenacity is such as to require distinct management in this respect in various localities; but all the clay dug for tile-making will require to be wheeled to the place where the pug-mill is to work it; it must be there well turned and mixed in the spring, and properly wetted, and finally spatted down and smoothed by the spade, and the whole heap well covered with litter to keep it moist and fit for use through the ensuing season of tile-making.

2d Point. Machine for making tiles.

For the reasons already alluded to, I prefer Hatcher's machine. Its simplicity of construction, and the small amount of hand-labor required to work it, would alone recommend it; for one man and three boys will turn out nearly 11,000 pipe tiles of one-inch bore in a day of ten hours, and so in proportion for pipes of a larger diameter; but it has the great advantage of being moveable, and those who work it draw it along the shed in which the tiles are deposited for drying previously to their being burnt: thus each tile is handled only once, for it is taken off the machine by the little boys, who stand on each side, and at once placed in rows on either side of the drying shed; thus rendering the use of shelves in the sheds wholly unnecessary, for the tiles soon acquire a solidity to bear row upon row of tiles till they reach the roof of the sheds on either side; and they dry without warping or losing their shape in any way.

The price of the machine is £25; and it may be proper to add, that the machine makes the very best roofing-tiles that can be made, and at less than half the price of those made by hand, as well as being much lighter, and closer, and straighter, in consequence of the pressure through the die.

It is necessary, in order to ensure the due mixing of the clay, as well as to form it into the exact shape to fill the cylinders of the machine, to have a pug-mill. Messrs Cottam and Hallen make these also, and charge £10 for them.—This mill must be worked by a horse; in general one day's work at the mill will furnish rather more prepared clay than the machine will turn into tiles in two days.

3d Point. Sheds for drying.

The sheds necessary for this system of tile-making will be of a temporary kind: strong hurdles pitched firmly in the ground in two parallel straight lines, 7 feet apart, will form the sides of the sheds, and the roof will be formed also of hurdles placed endways and tied together at the top, as well as to the upper slit of the hurdle, with strong tarred twine, forming the ridge of the roof exactly over the middle of the shed. They must then be lightly thatched with straw or heath, and the sharpness of this roof will effectually protect the tiles from rain. Two of these sheds, each 110 feet long, will keep one of the kilns hereafter described in full work.

N. B.—These sheds should be so built as to have one end close to the pug-mill and the clay-heap, only leaving just room for the horse to work the mill, and the other end near the kiln. Attention to this matter saves future labor, and therefore money.

4th Point. Construction of kilns.

The form of the clay-kiln is circular; 11 feet in diameter, and 7 feet high. It is wholly built of damp earth, rammed firmly together, and plastered inside and out with loam. The earth to form the walls is dug out round the base, leaving a circular trench about 4 feet wide and as many deep, into which the fire-holes of the kiln open. If wood be the fuel used, three fire-holes are sufficient; if coal, four will be needed. About 1200 common bricks are wanted to build these fire-holes and flues: if coal is used, rather fewer bricks will be wanted, but then some iron bars are necessary—six bars to each fire-hole.

The earthen walls are 4 feet thick at the floor

of the kiln, are 7 feet high, and tapering to the thickness of 2 feet at the top; this will determine the slope of the exterior face of the kiln. The inside of the wall is carried up perpendicularly, and the loam plastering inside becomes, after the first burning, like a brick wall. The kiln may be safely erected in March, or whenever the danger of injury from frost is over.—After the summer use of it, it must be protected by faggots of litter against the wet and the frost of winter. A kiln of these dimensions will contain

47,000	1	inch bore pipe tiles.	
32,500	$1\frac{1}{4}$	"	"
20,000	$1\frac{3}{4}$	"	"
12,000	$2\frac{1}{4}$	"	"

and the last-mentioned size will hold the same number of the inch-pipes inside of them, making, therefore, 24,800 of both sizes. In good weather this kiln can be filled, burnt and discharged once every fortnight; and 15 kilns may be obtained in a good season, producing—

705,000	1	inch pipe tiles;	
Or, 487,500	$1\frac{1}{4}$	"	"
Or, 300,000	$1\frac{3}{4}$	"	"

and so on in proportion for other sizes.

N. B. If a kiln of larger diameter be built, there must be more fire-holes, and additional shed room.

5th Point. Cost of forming the establishment. The price charged by Messrs. Cottam and Hallen for the machine, with its complement of dies, is £25
Price of pug-mill 10
Cost of erecting kiln 5
Cost of sheds, straw 10
Total £50

The latter item presumes that the farmer has hurdles of his own.

6th Point. Cost of tiles when ready for sale.

As this must necessarily vary with the cost of fuel, rate of wages, easy or difficult clay for working or other local peculiarities, I can only give the cost of tiles as I have ascertained it here according to our charges for fuel, wages, &c. &c. Our clay is strong, and has a mixture of stones in it, but the machine is adapted for working any clay when properly prepared.

It requires 2 tons 5 cwt. of good coals to burn the above kiln full of tiles. Coals are charged here at 28s. per ton, or 1,000 brush faggots will effect the same purpose, and cost the same money; of course some clays require more burning than others; the stronger the clay the less fuel required.

The cost of making, the sale prices, and number of each sort that a wagon with 4 horses will carry, are as follows:

	Cost. s.	d.		Sale Price. s.	Wagon holds
1 inch pipe tiles..	4	9	per 1,000	12.....	8,000
$1\frac{1}{4}$ " ..	6	0	"	14.....	7,000
$1\frac{3}{4}$ " ..	8	0	"	16.....	5,000
$2\frac{1}{4}$ " .	10	0	"	20.....	3,500
$2\frac{3}{4}$ " .	12	0	"	24.....	3,000
Elliptical tiles.....				24 }	2,000
Soles.....				10 }	

All these tiles exceed a foot in length when burnt

The cost price alone of making draining tiles will be the charge to every person making his *own* tiles for his *own* use. If he sell them, a higher price must, of course, be demanded to allow for some profit, for credit more or less long, for bad debts, goods unsold, &c. &c.; but he who makes his own saves all expense of carriage, and, as his outlay will not exceed £50, the interest on that sum is too trifling to be regarded, and he has no additional rent to pay; and after he has made as many tiles as he wanted, his machine and pug-mill will be as good as ever with reasonable care, and will fetch their value.

I fear that no drawing could be made that would ensure a person erecting one of these kilns by it from the chance of failure; and I do not know any way by which these kilns can be erected, and the mode of using them taught, so as to obviate disappointment, except by Mr. Hatcher being engaged to erect one or two in a county, which will serve as models.

It will not be improper to put those who may adopt any machine for tile-making upon their guard against the prejudices of tile-makers. The necessity and the demand for draining tiles has infinitely outstripped the possibility of the supply being furnished by hand-work alone in the old way: but as the services of every man who has been used to this work will be more than ever needed, the employer will find his account in securing them for the working of his machine by giving liberal wages, and by convincing the men that their earnings by work, not so laborious, but more effective, will be at least equal, and they will soon really be greater than they obtained from their former occupation.

I hope that this paper will prove the means of saving a large expenditure on buildings of a permanent character, where *draining tiles only* are wanted to be made; as such buildings, under such circumstances, will become useless when they have supplied the district immediately around them: for land once thoroughly drained with tiles, and on true principles, is, generally speaking, drained for ever.

With sincere regard I remain, my Lord
Very truly yours, THOS. LAW HODGES.
Hemsted, Kent, Dec. 18, 1844.

NOTE BY MR. PUSEY.

If Mr. Hodges should succeed in rendering the making of draining-tiles a domestic manufacture, he will have set the seal to their cheapness, and thereby conferred a great boon on Farmers. As there is no point in which our Society has been more successful than in reducing the cost of drainage, we may take this occasion of looking back to what we have done.

In the first Number of our Journal, published in 1839, I find the following passage:—"The expense (of thorough-draining) is estimated from £3 to £12 per acre, according to the frequency of their application." The price in my own neighborhood and in the Isle of Wight was then 60s. per 1,000 for tiles, and 30s. for soles, being 90s. for every 1,000 feet of materials.

In 1841, we discovered that Mr. Beart in Huntingdonshire was selling tiles of about the same size for 22s. and the soles for about 10s. being 32s. for every 1000 feet of materials.

In 1843 we found that pipes of various shapes were sold in Suffolk and Kent at 20s. per 1000, being 20s, for every 1000 feet of materials.

I was thus enabled in May, 1843 to give the following reduced estimate for draining an acre of land:—

Distance between Drains.	Pipes.			Total Expenses.		
Feet.	£	s	d.	£.	s.	d.
66	0	13	4	1	0	0
44	1	0	0	1	10	0
33	1	6	8	2	0	0
22	2	0	0	3	0	0
$16\frac{1}{2}$	2	13	4	4	0	0

Our engineer, Mr. Parkes, has since examined the subject of pipe-drainage most minutely. He has proved that in theory an inch-pipe can discharge the heaviest rains from the land, and he has gone far to show their efficacy in practice. Mr. Parkes, in his Report on the Implements shown at Southampton, announces that such pipes are actually now selling in the Isle of Wight for 12s. per 1000. I may, therefore, after so short an interval again have the pleasure of laying before the Society further reduced estimates of the price of drainage. The most convenient measure is, I think, the furlong, because that is the old dimension in length of an acre, the width being 66 feet; and if the cost of one drain for that width be known, it is easy, of course, to calculate for nearer distances. A furlong, too, is equal to 40 poles, a common length in calculation for the digging of drains.

Cost of Thorough-draining one Acre.

Distance between Drains.	Length of Drains in Furlongs.	Feet of Pipes.	Cost of Pipes.	Forming Drains 30 in. deep.		Total cost.		
Feet.			s.	s.	d.	£.	s.	d.
66	1	660	8	8	0	0	16	0
44	1½	990	12	12	0	1	4	0
33	2	1320	16	16	0	1	12	0
22	3	1980	24	24	0	2	8	0
16½	4	2640	36	36	0	3	12	0

A trifling addition must be made for main-drains. In laying down the pipes we should look to those counties where draining was invented, and has been practised most largely. I mean our Eastern Counties, Essex, Suffolk, Norfolk, Herts. &c. For, as Mr. Copinger Hill* informs us, "On the heavy lands of Suffolk and the adjoining counties under-draining at a distance of 16½ feet and a depth of 26 or 30 inches *is as much a matter of routine as hedging and ditching.*" Now the usual shape of drains there is extremely narrow at bottom, tapering down from a width of 4 to that of 2 inches, as shown in the drawing given by him, and here repeated.

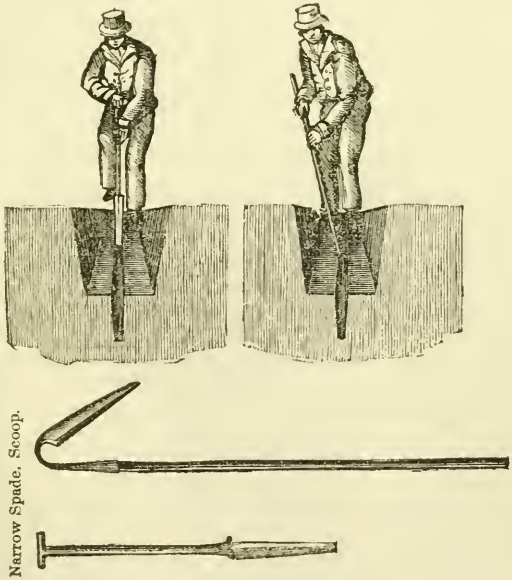
It so happens that this old and approved shape from the birth-place of thorough-draining is precisely adapted to our most modern improvement, the small pipe. The Essex tools which have been for some time employed by my workmen, were found by them last winter equally adapted, at least in very strong clay, for pipe as for thorn-draining. They are the old-fashioned narrow spade and the scoop. With this narrow spade three cuts are made, two on the sides of the cut, and one across; but in clays perfectly free from stones, I believe that the bitting tool mentioned by Mr. Arkell in his Prize Essay on Drainage is even better. I will only add that if Mr. Hodges's temporary kilns and sheds should enable the farmer to make inch-tiles at 4s. 9d. per 1000, the estimates for draining an acre must be further reduced as follows: on clay-lands without stones:

Distance between Drains.	Length of Drains in Furlongs.	Feet of Pipes.	Cost of Pipes.		Forming Drains.	Total cost per Acre.		
Feet.			s.	d.	s.	£.	s.	d.
66	1	660	3	2	8	0	11	2
44	1½	990	4	9	12	0	16	9
33	2	1320	6	4	16	1	2	4
22	3	1980	9	6	24	1	13	6
16½	4	2640	12	8	48	3	0	8

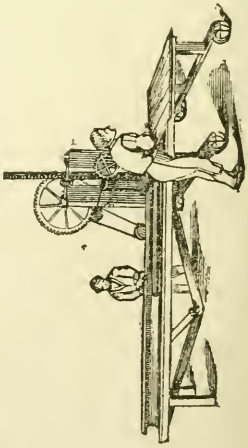
The ordinary distances may be taken at 33 and 22 feet, giving the length of drains 2 or 3 furlongs per acre. If land can be thus permanently drained for little more than a pound or a guinea and a half per acre, and if the closest drainage that can probably be required may be done for three pounds per acre, there will really be no longer any excuse for an undrained field in any part of the country.

PH. PUSEY.

*Society's Journal. Vol. iv. p. 26.



Narrow Spade. Scoop.



Hatcher's Bennenden Tile Machine.

LIME AS A FERTILIZER.

THE use of Lime in building, is of the earliest antiquity, but for the purpose of manure, the use of it has been confined to Europe and North America; that employment of it never having been thought of in Asia or Africa, though the substance itself is every where is to be found.

In this country, the application of Lime to land has greatly increased, within the present century. An impression of its durability over other fertilizers, has contributed much, no doubt, to its popularity; yet while the use of it is extending, the question as to its mode of action, has not been definitively settled. On that point much difference of opinion exists, as there does also, about the *modus operandi* of Sulphate of Lime, or Plaster of Paris—some maintaining them to be manures in themselves, entering into the composition of the plants, while others believe that they contribute—especially Lime—to the decomposition of the vegetable matter it finds in the soil; preparing it to afford food and sustenance to the growing crop.

Those who contend that Plaster of Paris acts its part, by drawing moisture from the atmosphere, are required to say why it does not thus benefit vegetation by drawing moisture from the atmosphere, as well in one region of country as another. Yet it is well known that so great is the difference of its action in that respect—so inert is it in one country and so powerful in another, that nothing is more common, when a landholder offers to sell his estate, than for him to be asked, first of all—"*Is yours plaster land?*" And this is easily understood, since it is well known, that where plaster or sulphate of lime will act, as it does on the old soft yellow looking, broom-sedge lands of Calvert, Prince Georges, and Anne Arundel counties, in Maryland, no fertilizer, natural or artificial, vegetable, animal, or mineral, is to be compared with it, in point of cheapness and efficacy, up to that degree of melioration which results in a heavy crop of red clover; and which reaches to, if it does not *end* with, the production of about eight barrels (40 bushels) of Indian corn, or one thousand pounds of tobacco. As it is with Lime, so it is with Plaster of Paris, the first application is attended with the most obvious effects; but this may be because there is then the greatest room for improvement; and consequently the effects are more visible. But the question has been raised, whether applications of plaster, however often repeated, will do more than (and that by means of the grass crops, especially clover, it secures) keep the land to that moderate point of productiveness, ever after, which is the result of the first clover crop that follows the use of it. We say moderate productiveness, because, surely every farmer is bound to esteem forty bushels of corn as very moderate, in the face of so much testimony to prove that eighty bushels have been frequently, and sometimes one hundred, gathered from an acre.

The evidences of the power of Lime to carry up the produce of land to a much higher measure, and to maintain it there much longer, than other manures most in use, have as before said, greatly contributed to extend the use of it.

Observation of its great potency, especially in Pennsylvania, among a people slow to be moved, and not liable to be wheedled in practical matters, has caused much inquiry to be made as to the *mode of using it* most common in that country, and much, accordingly, has been written on the subject. The agricultural journals abound in descriptions of the *practice* of liming, and with speculations as to the proper *time* and *quantity* to be applied; and in what reference, direct or remote, to other manures, and to particular crops.

The point in regard to which we apprehend hurtful mistake is most likely to occur, is, as to *the state in which it should be applied:* that is, how soon from the kiln, and what treatment it should undergo in the meantime; how much or how little should it be purposely exposed to wet or rain or dew, or to be left in a condition to draw moisture from the atmosphere.

As to the season of the year, the answer related by Doctor DARLINGTON, of West Chester, Pennsylvania, a writer to whom Agricultural Science is so much indebted, as having been given by a Dutch farmer, probably comprehends all that need be said: "Never mind," was his reply; "when—so you *get it on your land!*"

But the time is not now, however lately it may have been, when farmers of the first order of intelligence will be satisfied with knowing the mere mechanical routine of time and quantity. An impulse has been given to the mind—its faculty of curiosity, the mother of knowledge, has been excited, and men who were content to know *how much* will do, now demand to know *the way in which it works.* Tell us, say they, *how it acts,* and we shall better understand all the details of practice, and be better prepared in case of disappointment, in a particular case, to ferret out the reasons of the failure, and to

guard against its recurrence. Without this knowledge of the mode—the philosophy of its action; we shall be ever liable to mistakes; and besides, says the agriculturist of the new school, there is neither satisfaction nor honor, even in success, which, as far as the farmer is concerned, he has not much more agency in securing, intellectually speaking, than the man he hires, or the horse he drives.

Hence it is, that the newly-awakened spirit of inquiry is busy to find out the true science of all things that come within the compass of the farmer's calling. The true theory of the rise and recession of the sap—the birth and strange metamorphoses of insects—the physiology or laws of animal and vegetable life—and of the nature and action of manures—and first of all, perhaps, of *Lime*.

Is it not apparent that when that point comes to be clearly settled, it may be used with greater judgment and confidence, and with so much the less chance of abortion? For example, if its mode of action is only to convert vegetable substances present in the land from one condition, useless as food for plants, into another which may form for them their most nutritious food, does it not follow that it would be a profitless waste of lime to bestow it where there was obviously no such vegetable substance to be acted upon? But, without further preliminary, we proceed now to give an essay, at hand, on the use of Lime.

What we have here written is not only as an introduction to this essay, but once for all to advertise the reader, that when other dissertations on the same subject, presenting other views, find a place in the Farmers' Library, it will be under promptings, and with motives such as have been here explained.

The more than 100 pages, appropriated monthly, by the publishers of this journal, will afford us ample space "and verge enough" to spread before the intelligent reader the various theories contended for, where investigation has not removed all doubt, and we deem it but fair to afford him a view of the several facts and opinions upon which he may exercise his own judgment, and form his own conclusion.

In the September number, we shall give another dissertation, presenting additional, or other views.

ON THE ACTION AND USES OF LIME IN AGRICULTURE, AND THE MOST EFFICIENT AND ECONOMICAL MODES OF APPLYING IT TO THE SOIL. By JAMES ANDERSON, Esq. of Gorthleck, Inverness-shire. [Premium, 10 Sovereigns.]

The action of lime in agriculture depends much on the state in which it is applied to soils, whether pure as an oxide of calcium, or combined with an acid, and then, chemically speaking, a salt of lime, and likewise on the condition and composition of the soil in various respects at the time of its application.

The lime of agriculture is principally derived from large deposits of native carbonate, (lime stone,) and, in this form, it is found in frequent and very considerable quantity among the various geological formations. The sulphate of lime (plaster of Paris) is also found in very considerable quantity in Germany, including Austria, France, Switzerland, Spain, the American States, the Peninsula of Nova Scotia, and New Brunswick, in our own country, and elsewhere, abundantly. However, the sulphate is not in Britain yet applied directly to the soil so extensively as in America and other countries; it exists in vegetable ashes, and is sometimes so applied in this country, particularly to the leguminous crops, as the clovers, with very beneficial effects. In Holland, the utmost confidence is placed, and with apparent good reason, in the restorative and fertilizing powers of the ashes of bituminous peat.

Phosphate of lime, another salt or acid compound of this substance, is applied in bone manure, being the principal mineral integrant in their composition; and it is also supplied to the soil by the application and decomposition of the vegetable fibres and animal substances which find their way into the fructifying mass of the farm-yard manure heap. It occurs in nature in veins and beds in connection with tin and iron ores, and is found in masses in Britain in Devonshire and Cornwall—and in at least one locality in Spain, besides in Saxony and Bohemia, and elsewhere. This substance would be well worth a fair trial in various soils, and we have every reason to think, from experiments on a small scale, it might prove a valuable manure.

The principal supply of lime, however, for agricultural purposes is derived from the application of strong heat to the native carbonate, which expels the carbonic acid, and in this state it is carried to the surface over which it is to be applied, where it is slaked with water, with which it readily combines, being at the same time reduced to a fine powder, the most convenient form for its application to the soil.

When pure, before uniting with water, carbonic or other acid, it is known under the familiar appellation of quick-lime. Applied in this state to soils containing organic substances, it enters into union with these substances and forms compounds which are partially soluble in water. All organic substances contain abundantly carbonaceous matter and oxygen, and, by attracting these, the quick-lime is gradually converted into a carbonate. But in practice the quick-lime is generally slaked with water before it is applied to the soil, in order to reduce it to a powder; and it is thus more equally divided in the process of scattering it over the surface. When slaked, or in union with water, it is chemically styled a hydrate, and operates in the same way as quick-lime in reducing or combining with organic substances. It retains no longer the same action; but, on the contrary, operates powerfully in preventing the too rapid decomposition of organic substances already in a state of solution or approaching to it.

Having stated generally, in a few words, the action of quick-lime and hydrate, and carbonate or mild lime, we shall reserve the details of the most efficient and economical modes of application to be specified and explained as they may naturally suggest themselves in our progress.

1. We have to consider the most suitable

period in the rotation for the application of lime.

With a view to economy and efficiency both, this must be when the land is preparing for a fallow or fallow crops. It should always in this case be applied as a hydrate. At this time an opportunity is offered, when the land is in progress of tillage at any rate, of intermixing and thoroughly incorporating the lime with the soil, when it immediately acts, as before stated, upon any insoluble organic substances which it may contain; and, instead of remaining dormant, inactive, and useless, as these substances had been during the previous rotation, they gradually form combinations with the lime, which become partially soluble in water, and thus, when lime is judiciously applied to a fallow, it is one reason for a smaller quantity of manure sufficing. This, of course, will only happen when there has been an accumulation of fibrous and insoluble organic matter in the soil, which is always the case in newly improved land, and where the soil, though in cultivation, has never previously undergone liming, and more particularly if it contains in itself little native calcareous matter.

With regard to the crops to which lime is found most beneficial, we shall begin with the *Cerealia*, and of these we shall speak to wheat, barley, and oats. We know, in innumerable instances, that wheat is grown on soils previously incapable of yielding an abundant or remunerating crop. We do not doubt that this is partly owing to the previous operation of efficient draining, as the most ignorant agriculturist is now aware of the fact, that the application of manures, organic or inorganic, is comparatively fruitless without attention to draining, as a preparative, in the first instance.

From the previous application of lime to a fallow, we see a very moderate allowance of manure— consisting either of bones, themselves containing a large proportion of phosphate of lime—and various combinations of decaying organic substances, produce an admirable crop of turnip, and thus prepare the way for a rich and luxuriant crop of barley, and this, too, on soils that ranged formerly very low indeed in the scale of fertility, but have been quickened into life and productiveness by the presence of this new agent. We have seen also a very superior crop of barley frequently produced on barren moorland, by the simple application of lime, and with a very little addition indeed of in-nutritious and ill-prepared manure in our own island, at an elevation of 800 or 900 feet, and between latitude 57° and 58°, and this too on a soil, to say the most for it, of average barrenness.

As to the oat crop, in the rotation, we have not observed that it is by any means proportionally so much improved by the application of lime. But this may be accounted for by the great exhaustion of manure caused by the luxuriance of previous barley crops. In high and cold localities, where oats are cultivated as the principal grain crop for winter fodder, and the lime applied and harrowed in above the plowed natural lea, the effect on the crop has been very beneficially apparent, particularly and chiefly where the land had been well drained before the application of the lime. The improvement in the succeeding pasture-grass was, if possible, still more remarkable and lasting. This is easily accounted for when we consider that the cold in this country, at considerable hights, and the consequent low natural temperature of the contained water in the soil, together tend to retard the decomposition of any portion of the fibre of the growing natural herbage that may be left unconsumed on the surface. But when lime is applied, it immediately dissolves this fibrous deposit, which has been, from the above causes, unceasingly accumulating, and converts it into wholesome and abundant nourishment for a higher and more useful class of plants. At great hights, then, and in cold localities generally, the effects of lime are particularly striking, and also very lasting, after draining.

Of the *Leguminous* crops, we may say unhesitatingly, from what we have observed, that they cannot be cultivated with any success without the previous application of lime, unless where abundance of native calcareous matter exists in the soil. The bean, indeed, and, so far as we have observed, the potato crop, are exceptions to this rule; although we have seen lime, in compost with earth or old turf dykes, give a most productive and valuable crop of potatoes.

Whether spread on the surface of pasture-land alone, or in compost with earth, or applied with a crop and grass seeds, with a view to pasture, it never fails to call into existence the dormant seeds of the superior grasses in the soil, and to nourish and facilitate the growth of those that may have been confided to it by the agriculturist. This is a fact placed beyond all dispute. It is a never-failing fertilizer of grass land.

2. The effects of lime on peaty soils are the following:—

Peat is known to contain two substances inimical to vegetation, and eminently preventive of the changes and interchanges, the decompositions and recompositions, necessary to afford a supply of genial nourishment to a superior class of vegetables. These injurious substances are tannin and gallic acid. But let us consider for a moment the composition of these inimical compounds, and we shall find that we have it in our power, by a simple process, to convert them into substances most friendly to the advancement of superior vegetation, and in this form contributing highly to the fertility of soils. We find on analysis that they are composed of the following constituent proportions:—

	Carbon.	Hydrogen.	Oxygen.
Tannin,.....	52.59	3.825	43.583
Gallic Acid,....	56.64	5.00	38.36

We have shown in the first part of this essay, that quick-lime and hydrate have a powerful affinity for carbonaceous matter and oxygen. This known, with the assistance of the above analysis, it is at once clear how they operate beneficially on peaty soils. It is evident that, by appropriating a portion of the carbon and oxygen, the lime neutralizes the acid in both these substances, itself becoming a carbonate; and, by this change, substances that were formerly destructive to fertility, combining in part with the lime, are resolved into their simple elements, and, assuming a new character, gradually become capable of sustaining an improved vegetation. Of course, as we have already shown, the lime will act on the fibrous vegetable remains in the soil, combine with them, and convert them by degrees into soluble and fructifying nutriment for vegetables. If, after peaty lands have been once limed, it should be found advisable, for any cause, to break up a lea, (and this should be as seldom as possible, such lands being better laid to grass,) it would be an improvement

to do so by paring and burning, as, by the application of heat, a portion of the lime, now converted into carbonate, from being so long buried and in close contact with the soil, would be freed from its acquired acid, and restored anew to its original state of purity when first applied —or, in other words, be reconverted into quick-lime— and would thus be rendered capable of exerting a renewed action on the peaty substances present, and, from its recovered causticity, again promote the various processes of decomposition and recomposition so favorable to the development of healthful and luxuriant vegetation.

3. The action of lime on clayey or aluminous soils is as follows:—

It operates both in the fertilization and comminution of clayey soils. From the minuteness of its particles, they easily insinuate themselves into the clay. On the particles of lime, too, encountering any enclosed organic matter in these aluminous masses a strong action immediately takes place between the lime and such matter, which, by combining with, disorganizing, and reducing such organic matter, destroys the continuous solidity of the clay which contained it; and from this, with the evolution of the gases and other attendant action, the stubborn clay at length becomes cellular.

4. In sandy soils, lime operates beneficially as follows:—

It is well known that sand (silica) differs much from clay (alumina) and lime, in two important characteristics particularly. Both lime and alumina have a great affinity for organic matter and moisture, and retain both these substances by a powerful attraction; sand has no such affinity, and on this depends its barrenness. It is merely commingled with organic matter at any time, never chemically combining with it in any quantity, and retaining it by no degree of attraction whatever, in this way it offers no resistance to the rapid escape of such substances by combinations with the components of moisture deposited by the atmosphere and the constituents of the atmosphere itself; and the fructifying properties of the manures are thus quickly withdrawn from the soil, and escape from it, in the aërial form, into the atmosphere. Besides this, they are washed away, in part, by heavy rains and superabundant moisture, beyond the reach of the root fibres of the crop they were intended to nourish. To cure these defects, lime is applied. From its affinity for moisture, it attracts it from the atmosphere, and, when voluntarily discharged from this source, promotes its retention in the body of the soil. By combining with any organic manures that may be added to the soil, it prevents their wasteful and too rapid escape; and thus, by rendering the soil more retentive of moisture and organic substances, and improving its texture and consistence, eminently promotes and increases its fertility.

After the explanation we have just given, it is difficult to see how lime can be dispensed with in the improvement and perfecting of any soil, unless that soil should be naturally calcareous. Such a soil effervesces powerfully with acids, and is thus easily detected by the most untutored inquirer. The only case in which we found lime to produce no great sensible or perceptible beneficial effect, or very little, was when superabundant moisture existed. But, even where the soil had been previously exhausted by overcropping and bad cleaning, we have found quick-lime, by destroying insects and their larvæ, and the seeds and roots of noxious and unprofitable plants, and by converting these, as already explained, into wholesome nutriment for succeeding crops, a most useful coadjutor, in connection with a well-conducted fallow, in restoring vigor and energy to the most exhausted subject. Where former injudicious applications of lime had been made, we can recommend no efficient restorative but a copious supply of organic manure and rest in grass.

One instance of abuse of lime we may particularly notice here. Thirty years ago and upwards, lime, at the rate of 200 bushels of hot shells an acre, was spread on between 100 and 200 acres of very light siliceous, open, dry, gravelly soil, scarcely 200 feet above the level of the sea, and within a mile of the coast, between lat. 57° and 58°, in north Britain, and being treated rather sparingly on some occasions, in after cropping, as to manure, till within the last eight years, though correctly farmed by the rotation of turnip, barley, and hay seeds, and hay followed by pasture for one year, and sometimes two years, it has not and will not recover this overdose for a long time to come.

Although the soil was poor, the lime, being new to it, exhausted at first all its organic matter, and produced wonderful crops for some years; but at length it came to be, that, in 1839, rather an unfavorable season, and frequently previously in a field of upwards of twenty-five imperial acres, there was not produced twenty quarters (160 bushels) of oats, and the quality not so good as the dressings of a very rich and productive crop. It will be a very expensive and unremunerating process to recover this soil by rest and manure. Some parts were, at the same rate and at the same time, manured with lime containing a trace of magnesia, and these portions of the surface are still quite distinguishable from the remainder by a vegetation of an aspect if possible more miserable, sickly, and attenuated than that which covers the general surface.

5. We now come to consider the effects of Lime on a deleterious subsoil. On this subject we can also venture to say a little, from some experience and attentive observation in the improvement of waste land, and from extensive draining of arable and waste in the progress of improvement.

Subsoils frequently hold in their composition deleterious substances, which consist principally of the salts of iron or manganese, and some acid, resembling the gallic and acetic, derived from the decay of vegetable substances. We have witnessed the benefit in these instances of the application of quick-lime. In the first place, the lime attracts and combines with the acids, by which means the salts of iron and manganese are neutralized, and the acid adhering to the lime is not merely rendered innocuous, but converted into a positively fertilizing substance. Where any sourness, or vegetable acid in any form, exists in the soil or subsoil, which very frequently happens on examining the composition of waste lands with a view to improvement, and which has been caused by the long existence and periodical decay, while in its unreclaimed state, of a worthless vegetation, if lime be applied, it immediately combines with and neutralizes the effects of such deleterious components, destroying the acid by withdrawing its carbonaceous matter and oxygen, and thus, becoming a carbonate of lime, materially adds to

its own value as as a fertilizing ingredient. This we have tested frequently, so as to satisfy ourselves of the efficiency of an application of lime in all such cases, and of the perfect propriety of recommending it to an improver whose chemical knowledge may not be sufficient to conduct the simple process of analysis, if he should have any good ground for suspicion from the dark color of the subsoil, or any other familiar and often locally understood symptom that such latent causes as we have been describing are operating against his interest.

The salts of the protoxide of iron amount to thirty-eight, with nine double salts, making together forty-seven salts of the protoxide of iron; and these are generally soluble in water. The known salts of the peroxide of iron amount to forty-three, with twelve double salts, making fifty-five salts of the peroxide of iron, and they are *all* soluble in the same menstruum. Most of the salts of manganese are soluble in water, and on their precise degree of solubility depends their destructive and injurious effects. The salts of iron, where water abounds in the soil, gradually form, by combining with the earths, as we have often seen, a most impervious and injurious subsoil; but on being freed, by draining, of excess of moisture, and broken up, and, more effectually still, if trench-ploughed after draining, and thus partially exposed to the fructifying and pulverizing action of the atmosphere, such a subsoil will be speedily rendered innocuous; and, if lime be thereafter applied, the cure is complete;—and, after resting a little, a soil thus prepared may be converted to the purposes of profitable culture.

6. We have already, under head 2, shown the effects of the application of lime in improving the texture, constitution, and general fertility of the soil. We may now add here, that when calcareous matter is deficient in soils, it will be highly beneficial to supply it even in the state of native carbonate, and without calcination, if a supply can thus be more cheaply and conveniently obtained from the sweepings of the highways, which often contain a considerable admixture of carbonate, or from any other native calcareous deposit, such as shell or clay marl, or calcareous sand, &c. Clay marl is best adapted to sandy or siliceous soils, and shell marl and calcareous sand to clayey or aluminous soils or stiff loams. However, when too easily obtained, such advantages are sometimes abused; several instances of this kind have come under our observation, and we may here mention one as an example. On an estate in North Britain, where a very valuable and extensive marl deposit exists, permission was given to the tenantry to apply this substance to their farms free of all charge: their holdings chiefly consisted of light siliceous and very shallow peaty soils, and the proportions were left to their own discretion. This deposit was very rich in calcareous matter. It was used with something like suspicion and distrust at first in any great quantity, but some favorable results so raised the expectations of the tenantry that they heaped on their land an unlimited bulk, and the consequence was, that a few years of fruitfulness and of injudicious, and too often incessant cropping were succeeded by yearly increasing sterility and loud and fruitless lamentations. The soil, of course, will require the same treatment to recover it as if it had received an over-dose of unmixed lime.

7. The quantity of lime which might be applied to the soil in different cases is a most important subject; also, whether it seems most beneficial to apply lime in large quantity and at long intervals, or in smaller quantity and at shorter intervals; and we shall endeavor to be as explicit and intelligible on the subject as we possibly can.

In a deep peaty soil there is little danger that the proper quantity of quick-lime will be exceeded, and carbonate may be applied in almost any probable quantity. We need only instance as grass-grounds the famous Orcheston meadows. In a sandy soil there is scarcely more danger that this will be the case with carbonate, neither will it be so with caustic lime, provided it be well mixed beforehand with clay or common soil containing a proportion of organic matter, such as old turf dykes or pond scourings, or suchlike substances. When a soil contains a fourth part of alumina, (a stiff wheat soil,) and lime is to be applied for the first time, it should never be in less quantity, at the very least, than 150 bushels of shells, heaped measure, to the acre. A third part of this quantity should be repeated on occasion of every *third* fallow thereafter, to keep up a desirable activity in the soil, a great proportion of the first applied quantity having by this time disappeared and been washed away by natural agencies; and on each occasion of a fallow, when no lime is applied, from one cwt. to two cwt. of nitrate of soda or potash to the acre should be carefully sown over the young wheat or turnip crop, as it may happen, a moist morning being selected for the purpose; and this will not only nourish and stimulate the young plants, and effectually destroy the numerous tribe of insects and their larvæ, so peculiarly destructive to the turnip crop in its first stages, but what is not appropriated of it by the plants descends with the moisture into the soil, and immediately acts upon the lime, now chiefly become a carbonate, by depriving it of its acid, and restoring it to its original state of purity, when its caustic properties are restored, and it again operates with the same activity as when first applied to the soil. It is necessary to apply the 150 bushels in the first instance to insure the effectual solution of the natural and necessary accumulation of the insoluble organic matter which must occur in a soil which has been covered with vegetation of any description; but a small application every third fallow, with the alkaline application to each of the two intermediate fallows, will thereafter prevent any such useless accumulation of insoluble organic matter, which needs must otherwise increase in the soil from the annual decay of the root fibres and other accidental and necessary remains of the different natural herbage, plants, and crops of the previous rotation.

When a soil is composed of four parts in five of silica, the remainder being principally alumina and organic matter associated with a portion of impalpable siliceous powder, it may be made a superior turnip soil, and incalculably improved by the application of carbonate of lime in large quantity; but about 100 heaped bushels of shells to the acre will be a sufficient dressing of caustic lime on a first application to the soil, care being taken that a fair allowance of manure is always supplied at each recurrence of a fallow, and it may be repeated in the same proportion and at the same periods (a third to every third fallow thereafter) as we have just recommended in clayey soils. The quantity of nitrate of potash or soda, be it observed, to be

the same in both cases, that is, the same both in aluminous and siliceous soils, but the proportion of lime to vary as 100 to 150, both in the first and successive applications. We have every reason to think, from all our patient investigation, experiment, and experience that this will eventually be found a very economical and effectual if not the most economical and effectual, method of applying lime to soils.

When easily and cheaply obtained, about fifteen bushels of wood or peat ashes, applied in the same manner, form a good substitute for the nitrate of soda or potash; and bituminous peat for this purpose is always to be preferred.

8. We have already stated that we have universally found that, unless thoroughly underdrained, it is in vain to expect any remunerative return from the application of lime, and we may add, any description of manure, whether organic or inorganic. Where superfluous moisture exists, the interstices of the soil are completely choked up with the fluid, the beneficial action of the atmospheric air excluded, a sourness contracted prejudicial to healthy vegetation, and the fructifying portions of the manure rendered inactive or washed away beyond the reach of a crop, while the temperature of the soil is also materially reduced by the presence of superfluous moisture.

9. The effect of applying lime along with other manures, that is, at the same season, and to the same crops with other substances, depends entirely on the period of the operation of fallowing at which it is applied.

If it be applied to the fallow before the dung, and harrowed sufficiently into the soil, intermixed and incorporated thoroughly with it, the lime will combine with and immediately operate in reducing all the root fibre and insoluble organic remains of the natural herbage or previous crops as it may happen to meet with, and thus convert into nutriment, for the succeeding crop, what was before of no service whatever; and if any acid or noxious rejected matter should be left by the plants of the previous rotation, as is believed by many scientific persons to be the case, the acid and noxious principles are neutralized by the lime, and the soil purified and enriched at same time. If not laid on, however, till after the dung is applied, of course it must and does abstract carbonaceous matter and oxygen from the manure, in the first place, combining with the more soluble portions, and this combination rendering them temporarily in great part less soluble, and thus not so well calculated to afford immediate nutriment to the succeeding crop. This may not be of such importance in wheat culture, which crop is best treated as a biennial, and thus remains a long time on the ground. But it does not appear to be so well calculated for a turnip crop, requiring as it does an immediate and concentrated supply of stimulating and soluble nourishment. With farm-yard dung it does and must operate in this way.

We have used street manure to turnips, which suits this crop better than most others. Street manure frequently contains a considerable portion of carbonate of lime, and sometimes native sulphate; but an application of caustic-lime, after adding this manure to the soil operates precisely as in the former case we have been describing, in forming compounds partially insoluble in water, and in withdrawing carbonaceous matter and oxygen, and thus being ultimately converted into a carbonate.

Rape-cake we have used very little, although, thrown into the soil along with the seed of turnip, in moist seasons, it makes a capital dressing, as we have often witnessed. It is well suited to clay soils in some cases; but it is scarcely adapted to a fallow, unless combined with more substantial and lasting manures.

We have used bones extensively in different soils, but always as limed land, and have never paid particular attention to the effects of applying both at the same season. We know, however, from very careful analysis, that the following is their composition:—

Cartilage—a compound of Carbon, Oxygen, Hydrogen, and Nitrogen	33.3	Carb. of Lime	11.3
Soda	1.2	Phos. of Lime	51.4
		Fluate of Calcium	2
		Phos. of Magnesia	1.16

Of course the application of caustic-lime would operate powerfully in reducing the bone, by acting on the cartilaginous portions, and withdrawing the carbon and oxygen; but we have always found the most efficient and economical method of applying this manure to be over a portion of spit dung previously deposited in the turnip drills, which is preferable even to mixing the bones with the manure to cause fermentation before applying the mass. The evolution of gases and volatile alkali, with the increase of temperature during the fermentation caused by the subterposition in the drill of the spit dung, affords the most forcing and stimulating nourishment to the tender germ, and has the further recommendation of economy and efficiency.—We have grown a very excellent crop of turnip on a very dry light siliceous gravelly soil, with eight bushels of bones, over ten single horse-cart loads of farm-yard dung, an acre.

With regard to *soot*, we have witnessed its admirable effects sown over grass lands, spring corn, tares, and young turnip, but have never seen it applied at the same time with lime. It is most effectual in destroying the numerous insects which prey on vegetables in their early stages. However, we should think it injudicious in the extreme to apply it with quick-lime, which would immediately and wastefully decompose its substance by disengaging a great portion of the volatile alkali, although there would not be the same objection to sulphate of lime, which would rather operate in preventing the too rapid disengagement and dissipation of its volatile parts.

We may conclude this head by remarking that where the object is permanent pasture, the application of the manure and the lime *at the same time* has been found beneficial, the effects being more lasting; but quick-lime or hydrate should never be applied to rich fertile old loams in cultivation, containing much soluble organic matter, unless as a compound with vegetable mould, or in some shape intimately combined with organic substances.

10. It seems superfluous here to describe the familiar operation of fallowing. All that one need say is, that after this cleaning operation has been carefully executed on the best principles, the lime should be well harrowed in and thoroughly incorporated with the soil. From being reduced to a hydrate it becomes so perfectly divided, and its particles rendered so minute, that the chemical action on any organic remains of former crops it meets with in the soil is immediate, and thus, rapidly becoming mild from this action, it is, in a manner, prevented from combining with the more soluble portions of the sub-

sequently applied organic manures. Care must always be taken not to exhaust the soil by over-cropping after the application of lime in any shape, and the most approved and least exhausting course or rotation adopted on similar soils should never be departed from; and a farmer should never yield to the lure of a deceitful fertility consequent on a first application of lime; for the stimulus which produced this fertility will speedily exhaust the vigor of the soil, unless its energy is supported by judicious management.

11. It is very advantageous in some cases to apply the lime in the form of a compost, with clay, earth, or sand. A sort of artificial marl is thus formed, which is advantageously spread on grass lands, affording them additional nourishment, at the same that the quick-lime or hydrate is partially deprived of its caustic property, which recommends the practice much—caustic-lime in powder being, in quantity, destructive to living vegetables. When the object is to improve the texture of a soil of sand, or clay, or peat, a compost has much to recommend it.—Lime combined with sand being best adapted to an aluminous or peaty, and with clay for a siliceous subject. A compost in such cases has been found to be eminently beneficial, and preferable to the application of unmixed lime.

ELECTRICITY

APPLIED TO AGRICULTURE AND HORTICULTURE.

As heretofore intimated, we may here repeat, that the experiments in the application of electricity, which have lately attracted a good deal of notice in Europe, have not been attended with results sufficiently uniform and encouraging to warrant plain, prudent, practical men, in giving their time and pains to a subject as yet rather too much *in the clouds*. Still, as one of the sentinels, on the look out for any thing that may turn up in this very age of invention and discovery, it will be expected of us to cry Who's there? whenever any thing new makes its appearance on the Agricultural Horizon.

In cases like this, as in the application of steam and the attraction of lightning from the clouds, the way is, perhaps too much so, to receive the first suggestions with distrust, if not ridicule. "Visionary enthusiasts," "crack-brained men" —generally pennyless, are left to go ahead, as they may, or fall as they often do, victims of poverty, distrusted and repulsed by your "practical man," and your "man of means"—such was the fate of Fitch—such of Rumsey. It was not their kind fate to meet with a BRIDGEWATER, an APPLETON, or a LAWRENCE; and the world knows them not as the first suggesters of steam appliance to navigation—poor they lived and dying are forgotten. Within the limits of this very corporation lives now almost unknown, if we are not misinformed, a second James Watt, in the person of a retiring and obscure genius—BOGARDUS.*

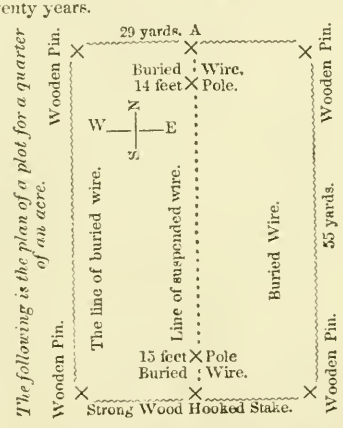
In the garret of the Treasury Buildings at Washington, is a gray headed man, of three score years and ten, with an eye and a soul fired with intelligence and spirit—the man who first measured the Sabine with chain and compass, who fought by the side of Jackson at New Orleans—a man who thirty years ago wrote in this city an "Emigrant's Guide," who of History, Geography, and Statistics, knows more than all in the building put together—and who does the reader suppose this man is and what is he about? It is no other than the venerable WILLIAM DARBY, employed this hot weather, through his 'ten hours,' at one of the lowest desks in the building, on the pay of a half-fledged midshipman, at work that any common clerk might perform—such is *political* justice—but we had no calculation of being borne away on a visit to him just now, even by force of electricity. *Electro-culture*, we were going to say, will be further experimented upon by scientific enthusiasts, and by those who mingle science with practice. If successful the public will hear of and enjoy the results. Until these are known, we shall do no more than note what occurs at home and abroad, as briefly as may be consistent with our duty to journalise such things. Happily the monthly space allowed us leaves us still room enough to keep pace with all practical developments. None, therefore, we are persuaded, will deem it inappropriate that we cater as well for the man of the closet, as for him of the field. For the votary of science who goes before to explore the grounds and mark out the way, as for the working man who follows after to reap and gather the fruits of his discoveries. What follows then, is what we have seen most worthy of preservation. We are aware that what is stated in reference to *Mr. Foster's* experiments, has already been published in most of the agricultural journals;

* See Proceedings of American Institute, vol. I page 424.

and will therefore be already familiar to most of our readers; but as some of the other articles refer to this statement it has been deemed best to preserve at once and together these different accounts and suggestions, that the subject may be, as far as this journal is concerned, dismissed until the close of the year, when doubtless we shall have reports of other and perhaps more particular and reliable observations.

In such a case it is better to do a little too much, than to fall short of what might be expected or useful.

Corn Cultivation by Electricity.—At a meeting, last week, of the Polytechnic Society of the West Riding of Yorkshire, the following description was given of the result of the first considerable experiment of applying the free electricity of the atmosphere to the cultivation of corn. Dr. Forster, of Findrassie House, near Elgin, had thrashed, weighed and measured his electric cultured chevalier Barley, and the product was the enormous quantity of 104 bushels, or 13 quarters per ton! The tail corn was not measured, and each bushel weighed 54¼ lbs. The weight of the straw was 9,300 lbs. per acre. The cost of the electric apparatus is £1 per acre, which will last for twenty years.



COST.

6 lbs. of iron wire at 4d. per lb. for buried wire,	2s.
4 do. do. at 3d. per lb. for suspend. do.	1s.
2 poles of dry wood, at 6d. each,	1s.
Labor, &c.	1s.
	5s.

As the area increases the cost diminishes rapidly. Convenient and desirable areas are for—

Two acres, 127 by 75 yds.		½ of an acre,	73½ by 33 yds.
One acre, 80 by 55 do.		¼ do.	55 by 22 do.
¾ of an acre, 82½ by 44 do.		⅛ do.	36 by 16½ do.

The mode in which the plot is laid out, is as follows: with a mariner's compass and measured lengths of common string, lay out the places for the wooden pins, to which the buried wire is attached, (by passing through a small staple). Care must be taken to lay the length of the buried wire due North and South by compass, and the breadth due East and West. This wire must be placed from 2 to 3 inches deep in the soil. The lines of the buried wire are then completed. The suspended wire must be attached, and in contact with the buried wires at both of its ends. A wooden pin with a staple must, therefore, be driven in at A, and the two poles (one 14 and the other 15 feet) being placed by the compass North and South, the wire is placed over them and fastened to the wooden stake, but touching likewise at this point the buried wire. The suspended wire must not be drawn too tight, otherwise the wind will break it. [Electro culture is a very interesting subject; but we must not allow ourselves to be misled by it. It is to be regretted that Dr. Forster's experiments are not given at more length; at present they are so imcompletely stated, that no opinion can be formed upon them. As to iron wires lasting in the ground for twenty years, that is inconceivable, unless they are protected in some way. Upon the whole, we think it better to wait, than to come to any conclusion either one way or the other.] Lond. Agr. Gaz.

Electric Agency applied to Horticulture.—I have been making several experiments, the results of which have been of the most satisfactory character. My application of the subtle agent has been through the medium of galvanism, and as it is generated it is totally under control, which is not the case if it is collected (as is generally the case) from the atmosphere, which is always subject to the uncertain fluctuations known to exist in telluric and atmospheric electricity. My experiments are, of course, far from matured, but yet they may not be void of interest to yourself.

First Experiment: I took an old 50-pair galvanic trough, and lined one-half the length of one side with zinc, and the opposite side in a similar manner with copper; they being about 12 inches long and 2 deep, leaving a distance between the plates of 4 inches, and connected by a zinc band. The trough was filled with moist soil and Turnip seed sown thickly upon the surface and pressed into it, but not covered, one-half being under the galvanic influence, the other in a natural state. Results: the seeds under galvanic influence swelled and sprouted many hours before the others, and twice as many vegetated; and by the time they were all well up the galvanic ones had the advantage of 24 hours. I should tell you that they were placed in a temperature of more than 60°, and were all well up in three days; therefore 24 hours is a most extraordinary advance.

Second Experiment: I lined a common flower-pot, 6 inches wide at the top and 4 at the bottom, with zinc and copper, as in the last experiment, the plates being, of course, deeper; I then sowed three Cucumber seeds in it, and three in another pot, without galvanism, and placed both in the same temperature, as the last experiment. Results: In the course of two days, the galvanic seeds appeared 11 hours before the others; in three days both were well up, the galvanised having greatly the advantage in strength and color, and going a-head rapidly. After a lapse of a fortnight, the galvanised seeds seemed to have the advantage of four days' growth, were much darker in color, and about twice as strong, healthy, and vigorous. I also tried an experiment with some Peas, which had been sown some time previously, and were just cutting the ground. A zinc plate, 1 foot square, was placed at the end of one of the double rows, and buried to an inch below its upper edge, and a similar plate of copper was buried

at the other end to the same depth, and connected by a copper wire. The weather was showery, and the growth of all was rapid. In the course of 30 hours, the galvanised ones had assumed a darker appearance, and were more regularly up than the others, and decidedly in advance; and in the course of a fortnight they were so much forwarder than the others, as to be easily seen at a considerable distance, and were altogether much higher and stronger. I am also trying an experiment with some Potatoes, but they are not up yet. These results have been so satisfactory to me, that I intend to try the principle upon an acre of Barley, and am preparing the wires for that purpose; and, when finished, will send you the results. A.

Royal Institution, May 16.

Reverend E. Sidney on the Electricity of Plants, and influence of Electricity on Vegetation. In introducing the subject of his lecture, Mr. Sidney took occasion to draw attention to the important nature of the inquiry, its high interest as a branch of natural science, and the valuable practical results which might possibly be brought to light in its investigation. The attention of electricians, he stated, had been drawn to the subject so long back as 1746, when a Mr. Maimbray at Edinburgh, announced that electrified plants grew more rapidly and vigorously than those that were not so treated; about the same time the Abbé Nollet discovered that electrified seeds germinated with increased facility; and these observations were confirmed and extended by the experiments of Bertholon and Jalabert, the former of whom attributed very marked effects to the use of electrified water.—The truth of these experiments was supported by some electricians, but denied by others, who, upon repeating them, could not perceive any effect produced on the electrified plants; amongst the latter class stands the name of Sennebier; but on reading the account of how his experiments were performed, it is no longer surprising that he failed to perceive any effect from electricity as he placed the seeds which were to be electrified inside an electrified vessel, a situation in which it is evident they would not be exposed to the electric influence. After briefly adverting to the more recent observations of Davy, Pouillet, and others, Mr. Sidney drew attention to the recent progress of the subject, and the high interest it was at present exciting. The first point which the lecturer insisted on, was, that electricity appears to exercise a powerful influence on growing plants; in support of which he quoted a number of experiments and observations, all tending to show that plants, under the influence of electricity, grow with increased vigor, and more especially when negatively electrified. The manner in which drooping plants have been observed to revive, on the artificial application of electricity, was also noticed; and, lastly, the effects which are found to be produced by thunder-storms were described. The rapid growth of plants during thunder-storms might, no doubt, in part be attributed to other causes; but, at the same time, it was a very fair inference that the electric condition of the air had something to do with the phenomena, as such a conclusion was borne out by numerous experiments, on a small scale, made with artificial electricity. Electricity of low, like that of high tension, has been found to affect germinating seeds and growing plants in a remarkable manner; it was noticed by Davy, that seeds germinated more freely at the negative pole of the voltaic battery than at the positive, and since his time numerous experiments have been made, all tending to prove that voltaic electricity powerfully affects plants. Mr. Sidney next drew attention to the facility with which fresh vegetable matters conduct electricity, in consequence of the good conducting power of the fluids which they contain; this was illustrated by placing a small blade of Grass in contact with the conductor of a powerful electrical machine, when it was proved that the whole of the electricity generated by the machine was quietly carried away by the blade of Grass. It was also shown that the pointed forms of the leaves and other parts of plants, combined with their good conducting power, fitted them most admirably to receive or disperse electricity; and hence electricians sometimes employed vegetable points in place of metallic ones for those purposes. To show this, a large Leyden jar was quickly and silently discharged, by bringing the pointed blades of Grass near its outer surface, and the brass knob at the top. In consequence of the high electric powers of plants, as might be supposed they exerted a marked effect on the electric condition of the atmosphere, so that when an electroscope indicated abundance of electricity in the free open air, it indicated none in the vicinity of a tree with pointed leaves. In illustration of the good conducting power of vegetable matter, Mr. Sidney stated that it was impossible to give an electric shock to a circle of people standing on a lawn, as the electricity invariably took the shorter and better conducting course through the Grass; whilst there was no difficulty in giving a shock to any number of persons standing in a circle on gravel. 3dly. The apparent adaptation of the various parts of plants to different electrical uses, was pointed out.—Thus, the first leaves of many plants are pointed and acute; others rounded or globose. The buds of most plants are pointed, or covered with a strong pubescence. Some plants, more especially those which grow rapidly, have an immense number of sharp points, or pointed hairs; whilst those which grow less rapidly, or are intended to meet the variations of the seasons, are less pointed, but often provided with dry thorns or prickles. As plants come into flower, they generally tend more to a globose form; the flower-buds are generally rounded, and the fruit, or seed-vessels, are seldom provided with acute points. It may, therefore, possibly be the case, that though electricity is favorable to plants at one stage of their growth, it is hurtful to them at others, just as is well-known to be the case with light, which is essential to them when full-grown, but is hurtful to them in the embryo state. The general phenomena of vegetation were then considered in relation to electrical agency. It would prove an interesting subject of inquiry, to examine in how far the rise of the sap in spring is influenced by electricity; it is certain that in spring, and before the leaf-buds are opened, whilst they still retain their pointed form, the air is dry, and in the most fitting state for electrical effects. Mr. Sidney then adverted to the singular powers which plants have of precipitating moisture from the atmosphere, an effect which he suggested might possibly be of electric origin, and endeavored to strengthen this view by a number of ingenious arguments; amongst others, the remarkable cases described by Mr. Weekes and other electricians, in which showers of rain were brought down by the use

of uninsulated kites. The lecturer next endeavored to show that the forms and geographical distribution of certain species of plants indicate a relation to their electrical properties. Thus, for example, the numerous Pine and Fir trees which abound in high latitudes, present most admirable extensive discharging apparatus for receiving or dissipating electricity; and, supposing the preceding observations correct, such trees would exert most important and beneficial influence in equalizing the electric condition of the atmosphere and tending to produce a greater uniformity of temperature. Lastly, the subject was considered as a purely practical one, and the prospect which there exists of electricity being advantageously applied to stimulate or assist vegetation inquired into. Mr. Sidney seemed to think it very questionable whether electricity could ever be usefully applied to the improvement of agriculture, but in horticulture (in forcing flowers and fruits,) he thought there were prospects of decided benefit; and, therefore, that this branch of the subject was well deserving a careful experimental investigation.—Electricity, both common and voltaic, might probably be advantageously employed in assisting the germination of old and dry seeds; and likewise, applied with caution, in the culture of exotics and other hot-house plants, its use might be productive of good results. The lecturer exhibited several plants which he had caused to grow in earth under the influence of a feeble current of voltaic electricity, generated by a plate of zinc and another of copper, connected together, buried in the soil beside the roots of the plants; and in the case of plants of Potato, Cineraria, and Mustard, which he exhibited, a very marked effect appeared to have been produced, as the galvanised plants were larger and much more vigorous than those without the plates.—He stated that he had also produced a very good effect on Pines, Cress, and Fuschias, but had found plants of Pelargoniums killed by the application of the zinc and copper plates. The well-known experiment of Dr. Forster, on Barley, was then described, and shown to be a decidedly unphilosophical arrangement, so that it appeared very doubtful whether electricity had anything to do with the large increase of crop said to have been obtained by that gentleman.—At the same time, the experiment was highly deserving of attention; and Mr. Sidney suggested that it would be well worth while to try experiments on electro-cultivation, describing several which have been commenced in Norfolk and elsewhere, on more accurate principles; he also gave a brief sketch of some of the experiments on this subject, at present being made by Mr. Edward Solly, in the gardens of the Horticultural Society. The lecture was, throughout, worded in the most guarded and cautious language, the whole subject being new, and but very little understood; it was, therefore, brought forward rather with a view to excite attention, and induce further research, than to propound theories, or make startling assertions. Mr. Sidney very justly observed, that putting all theories aside, there appeared to be sufficiently numerous well-authenticated facts to warrant further inquiry and experiment.

From the London Agricultural Gazette, June 7

ELECTRO-CULTURE.—The extraordinary effect of Electro-culture, as stated by Dr. Forster on his Barley crop, has induced me to make an experiment precisely according to the plan and diagram given in your number of the Agricultural Gazette for April 12th; but as I only put the wires down so lately as the 23d instant, after the Barley was above ground, it is too soon yet to expect any difference, and none is yet visible; but as I purpose making two or three more experiments on other crops, and I observe in your last Number that the experiment of Dr. Forster's plan is described as not being a very scientific one, and that experiments are now in progress in Norfolk and elsewhere on more scientific principles, I shall feel greatly obliged to you if you can furnish me with the particulars of such experiments, or of any one that you consider more likely to bring out the best results for my guide, before putting down any more diagrams on this interesting subject.—*X. Y. Z., A Subscriber.* [The effect, or rather the *tendency* of any metallic connection between the soil and the air, some 15 or 20 feet above, clearly must be to induce a similar electric condition between the two—to hinder any irregularity in the distribution of electric influence—simply because metals are good conductors of electricity. Whether such a result is desirable as regards the crops growing on the soil remains to be ascertained; but certainly, in order to obtain it that arrangement of wires must be best, in which there is the most perfect connection by conductors between the soil and the air. Perhaps other purposes may be answered by Dr. Forster's arrangement of wires; but so far as they tend to connect by electric conductors the soil and the air, we do not by any means think it the best that could be suggested. We have had since February a copper wire 120 yards long, studded with upwards of 1200 metallic points, suspended in a direction magnetically north and south, in a somewhat elevated position, at a distance from trees, and at an elevation of 20 feet from the ground; and this wire is connected with the ground by another, which, when it meets the ground, branches out and spreads over an extent of about the 8th part of an acre, on which Wheat is growing; but the plants have not *in appearance* benefited the least from it. Dr. Forster declines to be responsible (and justly so) for the results of experiments performed otherwise than as he has directed; but we cannot see what influence his arrangement of wires possesses that ours has not in a greater degree.]—The following is another communication on this subject, just received:—Since I communicated my trial of Dr. Forster's plan of electrical cultivation, a plot of Potatoes, similarly treated, has been followed by similar effects. The rows within the wire are distinctly visible, those without only partially appearing. In both cases, the row adjoining the buried wire is favorably affected, though not included in the square. This lateral influence every electrician would expect; the great wonder is, how the electricity is so perfectly confined within the wires.—Though, of course, the theory is nearly a mystery at present, we must infer that the aërial wire collects the fluid and the buried wire distributes it to the ground, through which it percolates and stimulates the vegetation. Of course if you extend the enclosed area too much, the supply of electricity would become inadequate. If you increase the number of aërial wires you would obtain more electricity, but fail in its gradual and equal distribution. For these reasons, which I think Dr. Forster has misapprehended, I still recommend future experi-

menters to try long narrow parallelograms, and avoid large areas. What has hitherto been done on this subject is of small moment: the attempts have been merely trifling and theoretical. Dr. Forster has the sole merit of first suggesting a useful and economical application of this wonderful agency. In fact, the great objection to the success of his system is, that such a sudden advance in cultivation as this promises has never been made before, and seems almost contrary to the laws of nature.

BETA.

EIGHTEENTH ANNUAL FAIR OF THE AMERICAN INSTITUTE.

OF this great national display of the products of *American* Agriculture, Arts and Manufactures, we have room only for a few words of exhortation to every friend of the substantial interests of his country to lend it his countenance and encouragement in every form. We are well advised that the exhibition will be opened to the public on Monday, the 6th day of October, 1845, at 12 o'clock M. at Niblo's Garden, Broadway, in the City of New-York. Contributions from exhibitors will be received on Thursday, Friday and Saturday of the previous week. To insure the most favorable locations, and the advantages of competition, the products of the Manufacturer, Mechanic and Artisan must be delivered and entered on the books of the Fair, on one of those days. The chance of a good location will be in favor of those who come the first and second days. Fruits, Flowers, &c. form an exception. The proper time for entering them will be specified in the Agricultural and Horticultural circular, or notices hereafter to be issued.

Arrangements already made, and in progress, for carrying out the Eighteenth Celebration, are on a scale more extended and attractive than ever before; and if public favor towards this institution continues to extend and increase each year as it has during the last seventeen, means will be afforded of enlarging the value of the premiums, and thereby creating a more intense and universal competition. Several opulent and munificent individuals, desirous of making the exhibition worthy of our great Emporium, and giving a fresh impulse to improvements in our country, have volunteered donations for the purpose; others have promised not only to contribute, but to use their influence to cause their friends to do the same. After reserving what discretion demands, to cover the annual current expenses of the Institution, every dollar will be expended by the Managers to promote improvements in Agriculture and the Arts. It is the fixed policy of the Institute, to appropriate every dollar for the benefit of that public which has been its generous, unfailing patron.

There will be an opening address, followed by novel and interesting displays of fireworks.

On Thursday, the 9th of October, a National Convention of Farmers, Gardeners and Silk Culturists will be held.

For the second week has been assigned the Cattle Show and other live Stock, and the plowing and spading matches.

The Anniversary and other discourses will also be delivered in the course of the second week.

The HORTICULTURAL exhibition of vegetables, fruit, flowers, &c. will be in Niblo's long promenade, and superintended by eminent Horticulturists.

The best new and useful inventions will be objects of the highest honors.

The following is the list of *Managers*—while their names give assurance that all will be done rightly, and in order, the thanks of the community are due to them, in advance of that performance, which with such citizens, is sure to follow their consent to serve:

Adoniram Chandler, Edwd. T. Backhouse, John Campbell, Jas. Van Norden, H. W. Childs, Joseph Curtis, Geo. Endicott, Wm. Hall, Joseph Torrey, Jas. R. Smith, Martin E. Thompson, Isaac Fryer, John D. Ward, Edward Clark, Robert Lovett, Gurdon J. Leeds, A. D. Frye, T. B. Stillman, Joseph Cowdin, Jas. J. Mapes, Geo. F. Barnard, C. C. Haven, Chas. Mapes, Jonathan Dodge, T. W. Harvey, T. B. Wakeman—*Managers.*

We may be allowed to add, with some sense of national pride, that in these exhibitions, our AMERICAN INSTITUTE here, at the great commercial Emporium of the Country, has set an example of sagacious attention to great public interests, which even London is only just now about to follow.

The London Athenæum has just announced the "possibility of establishing something of the kind in the British Empire." We, thanks to the indefatigable officers and managers of our Institute, are already in the fruition of what they are just hoping to accomplish. In the annunciation of their project, in the Athenæum of June last they say:

"Besides the delight and instruction which would certainly be afforded, it may fairly be expected that a periodical competition of this nature will exert some beneficial effect on the progress of the Arts; not only by exciting honorable rivalry in the producers, but by enabling the consumers better to appreciate real excellence.

Without entering into details, it may be stated, that the plan embraces the exhibition not merely of products, but of the instruments of production in actual work—the facility, rapidity, precision, and economy of the act of fabrication being often much more wonderful than the fabric itself. In carrying out these ideas, it is intended entirely to exclude all private, personal, and political objects. It is hoped that the plan may be preserved so free from objection on these points, as to command the approbation of all ranks, and justify its promoters in anticipating the highest patronage."

NEW-YORK STATE AGRICULTURAL SOCIETY.

CATTLE SHOW AND FAIR FOR 1846, TO BE HELD AT UTICA, SEPT. 16, 17, 18.

THERE is every reason to hope that this great gathering of practical Farmers, the bone and sinew of the land, will transcend in numbers and in display of the products of Agricultural Industry, all that have preceded it. At the season chosen, there will still be lingering a vast number of strangers, who have come to escape exposure to the enervating heat of Southern climes, and to observe the habits of their more thrifty brethren of the North. We would recommend all such to gather in at Utica, at the great Cattle Show—there they will see Northern men and Northern Industry in their true character and genuine colors—hard hands and hard sense, with their fat bullocks and their fine-wooled sheep—their sharp plows and sturdy oxen to turn the glebe—the 50 acre man, as proud in his position and as useful in his sphere, as any Lord of the Manor. After all, what is there to be envied, about the man of overgrown estate, except the sagacious industry which may have made him so; and the power that being so confers on him, to set useful examples in illustration of modes of improvement, and in the introduction of good things that require extraordinary means. In that light the rich man is truly enviable. In every department of Industry, in every implement of Agriculture, those who attend this great Exhibition, and that of the American Institute, may expect to see something new. Come, then, Farmers, one and all—these are your Holidays. Let it be there seen, that if the Merchant can boast his splendid Ship, sailing faster than the wind, the Manufacturer his Works, in which omnipotent steam is controled with equal ease to carve a seal or lift the ponderous tilt hammer; so you can show your well-tilled Farm, your sleek horses, your fat cattle, and rich products of the field and the orchard, the dairy and the garden; all emblems as well of *peace* as of *plenty!*

The public has been in so many forms advertised of the particulars for which premiums have been offered, that we see no occasion, even if we had room, for publishing the Bill of Fare in detail. The first on the list are:

For the best cultivated Farm, of not less than 50 acres, exclusive of woodland, regard being had to the quantity of produce, the manner and expense of cultivation, and the actual profits:
First premium.....$50 | Second do.....$30
Third do.....$20

But, what we humbly regard with peculiar approbation is the offer of Premiums:

For the best series of Essays on the importance of scientific knowledge in prosecuting successfully the ordinary pursuits of Agriculture....$100
For the best Agricultural Text-Book for Schools. 100
For the best Text-Book on Horticulture 50
For the best Essay on Subsoil Plowing, with the results of actual experiments in the State of New-York 20
For the best Essay on Draining, with details of the results of actual experiments, showing the expense and supposed increased value of the land..... 10
For the best Essay on Irrigation 10
For the best Essay on the Culture and Manufacture of Silk..... 20
For the best Essay on the prevalent Disease in Potatoes..... 20

CATTLE are classified into and premiums offered for *Durhams, Herefords, Devons, Ayrshires, Crosses of Natives and Improved, Native Cattle* and *Oxen—three year old, two year old,* and *yearling Steers,* and *Fat Cattle.*

SHEEP into *Long-wooled, Middle-wooled, Merinos* and their grades, *Saxons* and their grades, and *Fat Sheep.*

HORSES into *Stallions, Mares, Matched Horses* and *Geldings.*

SWINE into *Boars, Sows,* and *lots of Pigs.*

And, for the rest, prizes are offered for

Poultry, best *Farm Implements, Butter, Cheese, Maple Sugar, Corn-stalk Sugar, Silk,* various *Domestic Manufactures, Fruits, Flowers*—best crops of *Wheat, Indian Corn, Rye, Barley, Oats,* not less than *two* acres! and the various Vegetables most cultivated, besides *Hops, Flax, Broom Corn, Clover* and other *Grass Seeds.*

Those who present claims to premiums for farm-crops must state in writing the following particulars: The condition of the soil at the commencement of cultivation for the crop; the previous crop and cultivation, and quantity of manure used upon it; the quantity and kind of manure the present season; the quantity and sort of seed used; the time and manner of sowing, cleaning and harvesting the crop; the amount of the crop determined by actual weight or measurement; and the expense of cultivation. The land shall be measured by some surveyor, who shall

swear to the correctness of his survey, and that it was made with a chain and compass; and the claimant of the premium, with two other persons who assisted in measuring, shall certify under oath as to the quantity produced from the piece of land mentioned in the certificate of the surveyor; and a sample of grain shall be presented at the annual meeting, with the oath of the applicant that that same is a fair sample of the whole crop.

MISCELLANEOUS.

Wrought Iron Gate with cast iron pillars.....$10
Best iron Wheelbarrow.....Silver Medal.
Ornamental cast iron Vase on pedestal.....$8
Best sample Drain Tile.....Silver Medal.
Best quarter of an acre Ozier Willow.....$8

DISCRETIONARY PREMIUMS

Will be awarded for such implements, products, &c. not enumerated, as shall be deemed worthy of notice or encouragement.

REGULATIONS.

The premiums for Essays and Agricultural Implements will be open to citizens of other States; all others will be confined to residents of this State who are members of this Society, or who may become so by the payment of one dollar on entering their articles.

The trial of plows will take place at Utica, on Tuesday, the 15th day of September.

No premium will be paid on any animals or articles taken away before the close of the Show.

Premiums not claimed within four months after they are awarded, will be considered as donations to the Society.

All persons who intend to exhibit Cattle, Horses, Sheep or Swine, should give notice to THEODORE S. FAXON, Utica, or LUTHER TUCKER, Recording Secretary, Albany, previous to the 10th of September, that the necessary arrangements may be made for their accommodation; and all animals must be on the ground by 9 o'clock A. M. of the 17th of September.

All those who intend to compete for the premiums on Agricultural Implements, Butter and Cheese, Sugar, Cocoons, Silk, &c. should have their specimens on the ground on the 16th, that they may be deposited in their appropriate places, and the rooms suitably arranged on the day previous to the Show.

Applicants for premiums are requested to pay particular attention to the notes attached to the premiums on Fat Cattle and Fat Sheep, Butter and Cheese, Field Crops, Maple Sugar, &c.

The statements required from those who compete for Field Crops, must be sent to LUTHER TUCKER, Recording Secretary, Albany, previous to the 1st of January, 1846, and the premiums will be awarded at the Annual Meeting of the Society, on the third Wednesday of January.

Competitors for the premiums on Essays must forward their manuscripts to the Recording Secretary, Albany, previous to the 1st of January, 1846, free of postage.

No premium will be awarded, unless, in the opinion of the Judges of the class in which it is offered, the animal or article is worthy of such premium.

Prize animals and implements at the previous exhibitions will be allowed to compete for the prizes; but they must receive a higher prize, or in a different class, to entitle them to a premium. Should the same premium heretofore given them be awarded, they will receive a certificate to that effect, instead of the prize.

Animals and other articles offered for competition must be labeled with the names and residences of the owners at full length.

No viewing Committee, with the exception of the Committee on Discretionary Premiums, shall award any discretionary premium, without the previous permission of the Executive Board, expressed through the President.

☞ We have in type brief notices of several new Works on Agriculture, Gardening, &c. which we are obliged to defer to our next issue.

THE AMERICAN FARMER—*Baltimore.*—This oldest of Agricultural papers has changed its form and dress, from a quarto of 8 to an octavo of 32 pages; but it is animated by the same patriotic spirit, and aiming at the same honorable ends, with a zeal and courage that bid defiance to time and circumstances. The July Number contains no less than 76 different items and several illustrations. Among these is one labeled with the name of RIVERSDALE, the residence of Charles Calvert, Esq. (a seat of genuine old-fashioned Maryland hospitality,) and his Cow, CINDERELLA.

Whether the design of the artist was to bring the white cow into bolder relief, by blackening every thing near and around her, we know not. but truly the picture more resembles a "coal-field" than the verdant Riversdale we have been accustomed to admire. The Am. Farmer goes, however, for substance, not for show; and he who is not glad to get it for $1 a year must be very indifferent to what is going on in the Agricultural world around him. It is a much better paper now than when we sold it for four or five times as much. and would truly be worth its reduced price of $1, were it only to be used for ladies' hair paper!

GOOD SIGNS FOR THE SOUTH.—Such do we regard the multiplication of Agricultrual Journals. Two have just reached us: THE NORTH CAROLINA FARMER, edited by S. Jemay, Raleigh. The Editor tells us that the spirit of improvement is abroad in Georgia, South Carolina, Tennessee and Virginia, and adds, as to the prospect in North Carolina: "We are gratified to state, to the honor of the Counties of Granville, Orange, Mecklenburg and Buncombe, that they have all well organized Agricultural Societies, which have been some time in operation, and are marching forward in the work of improvement." For ourselves, we much doubt whether any people on earth better understand the philosophy of Agriculture than the leading men of the very region described. The misfortune is, want of—*perseverance* in resolution to bring about an amendment in State policy and individual habits and practices.

THE CAROLINIAN is another staunch advocate of the good cause—both discreet and vigilant, as the following may show:

Fine Flocks of Sheep in the Vicinity of Columbia, South Carolina.—The practical Agriculturist and genuine lover of rural affairs would be both gratified and amply repaid by visiting the magnificent flocks of Sheep belonging to Col. Wade Hampton and Mr B. F. Taylor, in the neighborhood of this city. Those who wish to be convinced of the fact that we can successfully raise fine sheep in our Southern climate, should go by all means. Examples like these are worth more than a heaped up mountain of

arguments, theoretically prepared by those who take interest in advocating such things through the medium of the Agricultural journals. The flock of Col. Hampton is superior to any other we have ever seen in any part of the United States. They are pure blooded Leicesters, and Bakewell himself were he living, would be proud to own them. They cannot have lost much, if any thing, of their characteristic superiority, if we judge by some of his animals which have matured. Mr. Taylor's flock is chiefly Merino with a dash of the blood of the African or Broad-tailed Sheep, and they have shown themselves to be extremely fine and prolific. He recently showed us the fleece of a buck lamb 14 months old, which weighed 10¼ pounds. Dr. Parker, the Superintendent of the Lunatic Asylum in this city, has just shorn a pair of last spring's Leicester lambs, about 14 months old, bred by Col. Hampton, and the weight of the fleece from the buck lamb was 13¼ pounds, whilst that from the ewe lamb weighed 11½ pounds.

Col. Hampton has shorn all his lambs of the present season, and we will make the wool growers of the North open their eyes when we state that the average weight of the fleece of about sixty head, was four pounds each. He has done this in order to relieve them from the oppressive heat of summer.

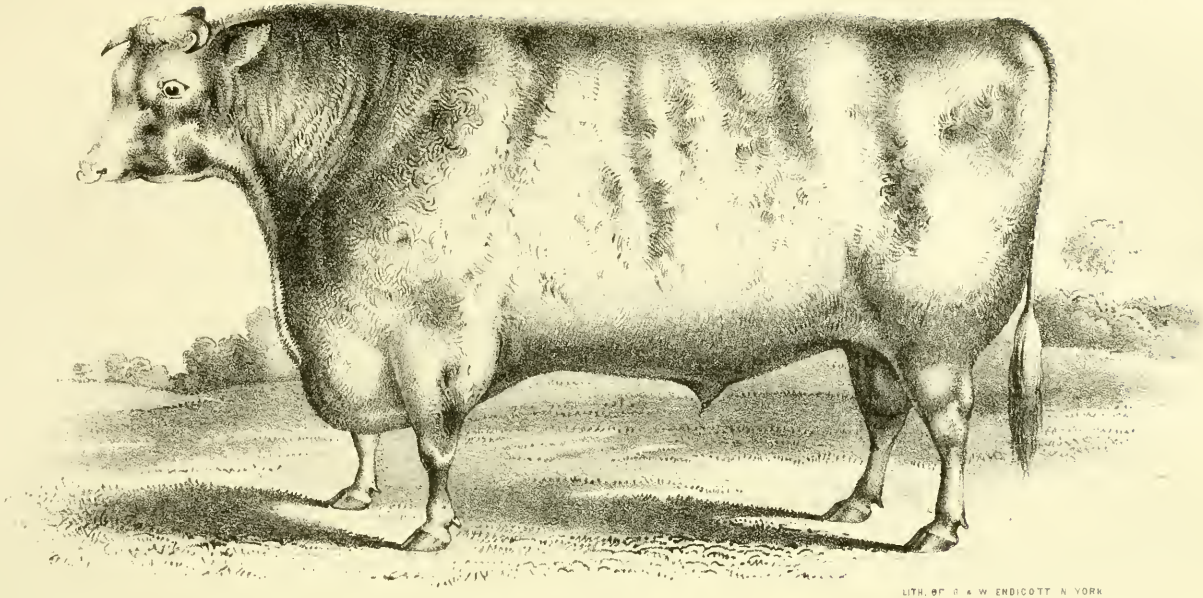
On visiting his flock a few days since, we found them in fine condition, without the least appearance of disease of any kind amongst them, and what is remarkable, they have kept in good order on very short pasturage, which is one of the very best evidences we can give of the thrift of this remarkable breed of sheep.

With such flattering results before us, why should we despair of making a great portion of our State profitable in this branch of rural enterprise. We have already adverted to the superior advantages of our mountain regions as sheep walks, and we shall on some other occasion gather information and give our own views upon the propriety of introducing good breeds of Sheep in the middle sections and lower country of South Carolina. That the whole sandhill region bordering on our extensive swamps is eminently adapted to this, has been fully proven by the success of the flocks above mentioned.

PRICES CURRENT.

[*Corrected, July 23, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort	℔ 100 lb.	3 81¼	@ — —
Pearls, 1st sort		4 12½	@ 4 18¾
BEESWAX—American Yellow		— 29½	@ — 30
CANDLES—Mould, Tallow	℔ lb.	— 9	@ — 11
Sperm, Eastern and City		— 27	@ — 29
COTTON—From		— 6	@ — 10
COTTON BAGGING—American		— 13	@ — —
CORDAGE—American	@ lb.	— 11	@ — 12
DOMESTIC GOODS—Shirtings	℔ y.	— 5	@ — 11
Sheetings		— 6¼	@ — 12½
FEATHERS—American, live		— 26	@ — 30
FLAX—American		— 6½	@ — 7½
FLOUR & MEAL—Genesee	℔ bbl.	4 37½	@ — —
Troy		— —	@ — —
Michigan		4 31½	@ — —
Ohio, flat hoop		4 31½	@ — —
Ohio, Haywood & Venice		5 25	@ 5 37½
Ohio, via New-Orleans		4 12½	@ 4 25
Pennsylvania		4 75	@ — —
Brandywine		4 75	@ — —
Georgetown		4 75	@ — —
Baltimore City Mills		4 62½	@ 4 75
Richmond City Mills		— —	@ — —
Richmond Country		4 62½	@ 4 75
Alexandria, Petersburg, &c.		4 62½	@ 4 75
Rye Flour		2 87½	@ 3 25
Corn Meal, Jersey and Brand		2 31½	@ 2 56¼
Corn Meal, Brandywine	hhd,	11 75	@ — —
GRAIN—Wheat, Western	℔ bush.	— 95	@ 1 05
Wheat, Southern		1 00	@ 1 06
Rye, Northern		— 65	@ — —
Corn, Jersey and North	(meas.)	— 50	@ — 53
Corn Southern	(measure)	— 50	@ — —
Corn, Southern	(weight)	— 49	@ — 50
Barley, Western		— —	@ — —
Oats, Northern		— 42	@ — 44
Oats Southern		— —	@ — —
HAY—North River	bales	— 50	@ — 75
HEMP—American, dew rotted	ton	85 —	@100 —
" " water rotted		120 —	@182 50
HOPS—1st sort, 1845		— 12½	@ — 15
IRON—American Pig, No. 1		35 —	@37 50
" Common		32 50	@35 —
LIME—Thomaston	℔ bbl,	— —	@ — 75
LUMBER—Boards, N.R.	℔ M. ft. clr.	30 —	@35 —
Boards, Eastern Pine		10 —	@11 —
Boards, Albany Pine	℔ pce.	— 7	@ — 12
Plank, Georgia Pine	℔ M. ft.	33 —	@35 —
Heading, White Oak	℔ M.	— —	@45 —
Staves, White Oak, pipe		45 —	@ — —
Staves, White Oak, hhd		37 —	@ — —
Staves, White Oak, bbl		28 —	@ — —
Staves, Red Oak, hhd		27 —	@28 —
Hoops		25 —	@30 —
Scantling, Pine, Eastern		14 —	@16 —
Scantling, Oak		30 —	@35 —
Timber, Oak	℔ cubic foot	— 25	@ — 37
Timber, White Pine		— 18	@ — 25
Timber, Georgia Yellow Pine		— 35	@ — 40
Shingles, 18 in	℔ bunch	1 50	@ 2 —
Shingles, Cedar, 3 feet, 1st quality		22 —	@24 —
Shingles, Cedar, 3 feet, 2d quality		20 —	@22 —
Shingles, Cedar, 2 feet, 1st quality		— —	@17 50
Shingles, Cedar, 2 feet, 2d quality		15 —	@16 —
Shingles, Cypress, 2 feet		11 —	@13 —
Shingles, Company		— —	@30 —
MUSTARD—American		— 16	@ — 31
NAILS—Wrought, 6d to 20d		— 10	@ — 12½
Cut, 4d to 40d		— 4½	@ — 4¾
PLASTER PARIS—℔ ton		2 50	@ 2 62½
PROVISIONS—Beef, M., new	℔ bbl.	8 75	@ 9 25
Beef, Prime,		5 75	@ 6 —
Pork, Mess, Ohio, old and new		12 62½	@13 12½
Pork, Prime, Ohio, old and new		9 75	@10 62½
Lard, Ohio	℔ lb.	— 7½	@ — 8¾
Hams, Pickled		— 6½	@ — 7
Shoulders, Pickled		— 4½	@ — 5
Sides, Pickled		— 6	@ — 6½
Beef Hams, in Pickle	℔ bbl.	12 —	@12 50
Beef, Smoked	℔ lb.	— 8	@ — 8½
Butter, Orange County		— 15	@ — 18
Butter, Western Dairy		— 11	@ — 13
Butter, ordinary		— 10	@ — —
Cheese, in casks and boxes		— 5½	@ — 6½
SEEDS—Clover	℔ lb.	— 6½	@ — 7½
Timothy	℔ tierce	12 —	@14 —
Flax, Rough		8 50	@ 8 75
Flax, Clean		— —	@ — —
SOAP—N. York, Brown	℔ lb.	— 3½	@ — 5½
TALLOW—American, Rendered		— 7	@ — 7½
TOBACCO—Virginia	@ lb.	— 2¾	@ — 5½
North Carolina		— 2¾	@ — 5
Kentucky and Missouri		— 2¾	@ — 5½
WOOL—Ame. Saxony, Fleece	℔ lb.	— 36	@ — 38
American, Full Blood Merino		— 32	@ — 34
American ½ and ¾ Merino		— 27	& — 28
American Native and ¼ Merino		— 24	@ — 26
Superfine, Pulled		— 31	@32 —



LITH. BY C. & W. ENDICOTT N. YORK

SHORT HORN BULL, PROPERTY OF SIR CHARLES TEMPEST, BART,
Winner of the first Prize of $500 at the Meeting of the Highland society of Scotland

New York, Published by Greeley & McElrath for the Farmers Library J. S. SKINNER *Edt*

MONTHLY

JOURNAL OF AGRICULTURE.

NO. 3. SEPTEMBER, 1845. VOL. I.

PORTRAIT OF A SHORT-HORN BULL:

WITH A BRIEF SKETCH OF THE QUALITIES OF THAT BREED, AND OF ITS INTRODUCTION INTO MARYLAND.

We pretend not to offer anything new in giving the portrait of a Short-Horn Bull; indeed it would be difficult to present anything in the way of form or description of the properties of cattle, with which agriculturists, at all accustomed to read the many excellent journals of the day, have not been made familiar. Nevertheless, the plan of the Farmers' Library would be but partially filled, if we did not, in due time, take care to have it represent pictorially, and in every mode of illustration, every sort of beast or bird that has been, or that probably might be profitably brought under our dominion, or employed in the purposes of the Agriculturist. We propose to make its pages the repository and instructor of the Naturalist as well as the Farmer

The animal selected has been taken pretty much at random, to give what we know to portray the characteristic points of that breed of cattle. We should have been glad now, as we shall at any time, to give the likeness of a Cow of this breed, imported from Ireland—sent out by Mr. Murdoch, a gentleman possessing a large share of various and useful knowledge, now residing at Asheville, N. C. The Cow to which we allude is *Sophy*, property of Mr. George Law, of Baltimore, and is probably equal to, if not the best milker in the Union.

The qualities of the short-horns have been so often described, and are so well known by their diffusion through the States, as to make it almost superfluous to repeat that they excel in symmetry of form, in early maturity, delicacy and lightness of head and tail, and in aptitude to lay on fat. As milkers they appear to have been condemned or approved, as purchasers have happened to get them of particular families—lactiferous secretions running in one family, as it is said, in a remarkable manner, while the fatty secretions in like manner distinguish other families of the same breed.

Then, again, the Herefords are not without their advocates, in England as well as America; while there are those who maintain that for all purposes—the pail, the shambles, and the yoke—the Devons, on a given amount of food, prove to be the most profitable, take them "by and large," for the generality of farmers and the common pastures of the country. The fine New-England Oxen are deep in this blood.

To all we shall hold an even scale of comparison—giving their forms to the life, and impartially delineating their qualities on the best testimony within our reach.

We well remember the sensation made in Maryland by the first exhibition of three improved short-horns—Champion, White Rose, and Shepherdess—at a cattle-show at the old Maryland Tavern, a few days only after their arrival. The very best cattle that the country could bring together were thrown so far into the shade that their owners hardly knew where to find them; and yet there were very fine cattle on the ground, of mixed blood, from the best cattle of Holland and Ireland, which had been imported by the late William Patterson and Mr. O'Donnell—to whose public spirit, so much at that time in the lead of their cotemporaries, we would fain do justice, even at this late day.

A few days before the arrival of the cattle above named—sent out at our instance, from what we had read of the excellence of short-horns—Governor Lloyd, a very large landholder and accomplished farmer of the Eastern

Shore of Maryland, had contended that on his large estate he had cattle equal to the crack stock of England. But when these three individuals sent out by the late Mr. CHAMPION, of Blythe, Nottinghamshire, England, (and paid for by funds liberally placed there by the late ROBERT OLIVER, at our instance, merely on the suggestion of the good he might thus do to the Agriculture of the State) came upon the show-ground, Mr. L. was seen to walk round and carefully examine them, and then instantly and on the spot offered $1000 for the Bull and the Heifer, White Rose. As we had no use whatever for them, and were, moreover, bound to see the friend indemnified who had provided the credit for their importation, we told him they could not be separated, but might all three be had for $1500—somewhere about cost and charges—with which he at once closed, and bought them forthwith, and afterwards said that he considered himself reimbursed by one cross of the bull on his numerous herds on the fourteen farms he owned on the Eastern Shore. Such is the history of this first importation of short-horns into Maryland—a history that may as well be preserved here as elsewhere in the Farmers' Library, where it ought to have place; and we might, perhaps, as well add, in candor, that resemblance between Champion, at two years old, and the Bull prefixed to these hasty remarks, may have inclined us to choose him from among a variety of fine engravings (the best of them by Scott) in the London Farmers' Magazine. As we have before said, the Herefords and the Devons, and the perhaps equally symmetrical and fine soft-skinned, but not so large, Ayrshires, and the ragged-hipped, deer-necked, rich milking Alderneys, shall all—all have their full and fair chance in good time. In the meantime we present the following essay:

ON THE GOOD AND BAD POINTS OF CATTLE, AND ON THE FORMATION OF FAT AND MUSCLE.

By Mr. ROBERT READ, V. S., Crediton.

The skin or external envelope in the ruminantia herbivora is an important feature in developing the disposition of cattle to fatten, and is of much import to the farmer and grazier.

A good skin is known by the familiar name of *touch*—that is, the animal should possess a mellow skin, with resiliency, moderately thick, yet loose and yielding to the fingers when gently elevated, and resuming its station with an elastic spring, as if there was underneath a tissue of wool impregnated with oil. The resilience of good skin in an animal depends on the organization beneath it, and the presence or absence of cellular or adipose tissue. The existence of this membrane constitutes a good handler—the deficiency the reverse.

The pilary or hairy covering should be thick, not coarse; glossy and soft, with an inclination to yellow, and in proportion as this exits as a quality or constituent, so is the propensity to fat: on the other hand, a thinness of hair and coarseness in fibre denotes an unthrifty animal, more especially if conjoined with a dense firm hide or skin, and with short hair. This implies a bad handler, and is a sure indication of being a slow feeder, with a tardy disposition to increase in volume, either of fat or muscle. It is by the feel of the cutaneous tissue that a judgment is formed as to the state of maturity now, and that an opinion be formed of the condition and worth hereafter. The beautiful mossy skin, that seems like soft velvet, its peculiar feeling as if it were stretched over a bed of down, when the fingers are applied, and its easy resilience when traction is made use of, are the best and surest prognostics as to the future worth of the animal.

Physiologically speaking, a mellow skin arises from a free circulation of the vascular system through the meshwork of the cellular or adipose tissue, or those cells that are destined for the reception of fat. These tissues are considered by some alike synonymous anatomically. They are always in a moist state, from the internal cavity of the cell performing the office of exhalation. Want or supply of interstitial deposit makes a good or bad skin.

The adipose and reticular tissues are extremely vascular, more especially that portion in immediate connexion lying under it. A good and kindly handler has a full development of this material well spread over the superficies of the external frame under the skin. The membraneous tissue is a bed for the origin of the absorbents, and the adipose tissue is the depository in which the fat is deposited by the exhalents peculiar to it. These membranes participate in the character of the hide. They are more dense and inelastic, and less expansive. They do not admit of being so readily dilated by the interstitial deposit, and, consequently, are longer in acquiring a mature state in the progress of making fat.

A thick and unyielding hide, not succumbing to the internal deposit in the adipose tissue under the skin, is thus continually reacting by pressure on the absorbents, and in this manner makes the animal slow in accumulating fat on the external parts of the frame. The difference in the feel between the glossy and coarse-haired animal is dependent on the secretion from the cutis. In the thick skin it is more inspissated, and exfoliates in branny scales. In the mellow and glossy skin it is more oleaginous, which may also be accounted for. Its having a greater freedom for the assimilation of nitrogen—one of the compounds of ammonia—a chemical agent that is abundantly given off from the skin and uniting with the unctuous exudation of the cutis, gives to the skin that peculiar saponaceous feel so necessary as the index of that organ performing its healthy functions, and may be ranked as a sure symbol of early maturity.

The ears should be of a fair proportion, not over large, thin in texture, and capable of free and quick motion. A good ear denotes good quality; a coarse ear, thick and large, is generally associated with much coarseness in the animal. A good ear is nearly always found in combination with a prominent and beaming eye, with thin palpebræ or eyelids.

This development of eye is most times in unison with a good and clean horn, tending to a very slight red at the radicles or roots. This indicates also a kindly disposition to early maturity. The happy and beaming eye of the healthy

animal shows contentment, a very desirable omen as to the quick growth of the animal; while, on the contrary, a heavy eye, with a want of vivacity, with thick eyelids, and a too visible conjunctiva or white of the eye, is indicative of an unhappy and restless temper, incompatible with a good and profitable feeder. The eye of contentment, of quietude, and of calm expression of countenance, is alone compatible with that temperament so conducive to accumulation of flesh and fat. These qualities, if derived hereditarily, will be maintained throughout the whole evolution of growth. They are also well-known signs of early disposition to maturity.—The hereditary principle should always be borne in mind—the old adage of "like will beget like"—whether applied to the symmetrical law of external form, of quality, of temper (either good or bad), of constitution, of a disposition to make either fat or muscle, or to any other cause inherently acquired. Therefore the only method to ensure those qualities which are so essential to the welfare of the farmer, is to commence primogenitively with the best and most approved principles that have hitherto been found to ensure a healthy and profitable stock.

I shall now speak of bone, as being the framework on which all the materials of the body are built. It should, when examined in the living animal, have the appearance of being fine and small in structure. It then augurs a good quality and being readily disposed to fatten, although it sometimes betrays too great a delicacy of constitution. A bone may be small from a consolidation of its structural parts, yet be capable of sustaining more weight, superincumbently, than bone of a larger size, and whose size depends only on the cellular expansion, and not on a cylindrical consolidation. A large bone maintains a coarse-bred animal, a dull feeder, with a torpid vascular action, that only tardily irrigates the frame with the living stream. Such animals have a greater disposition to lay on more muscular than fatty substance.

Having concluded my observations on the external structure, relative to the propensity animals have of making fat, I shall now offer a few opinions on the arrangement of the internal organs for that purpose.

The lungs should be large; but not occupying the chest too much posteriorly: the chest capacious, and deep anteriorly; these being the organs for preparing the arterial blood that nourishes every part.

I have also remarked, from inspection after death of hundreds of animals, that the roots of the lungs do not diminish in size so much as that portion which is in contact with the midriff in the fattening animal: lungs over large are not more productive of fat than those which are of a moderate size. My solution of this fact is, that if the lungs occupy too much of the chest in the posterior part, there is a limitation to the expansion of the rumen, or first stomach, and the animal does not enjoy so much lengthened quietude in rumination, a circumstance very essential to the fattening beast. This substantiates what I have before stated. The chest cannot be too deep nor yet too broad in its anterior external conformation; therefore, instead of attributing the full, spreading, wide-ribbed chest, posteriorly, as instrumental to the lungs, the space for the expansion of the stomach must not be overlooked, a large digestive apparatus being required for all large herbivorous animals. The heart is an important organ in the animal frame. It is rarely found over large in the fat animal. It is the forcing pump by which the whole of the body is irrigated through the arterial tubes. If symmetrical organization pervades throughout the animal, the chances are, that the vascular action will harmonize over every part, and the deposit of fat will equalize over the whole of the body. On the contrary, an animal with disproportionate parts will have a greater disposition to lay on muscle or fat on those parts respectively that have the greatest share of vascular action.

I am now proud to state some indisputable facts. I have many times examined animals by mediate auscultation, with capacious chests anteriorly, and the lungs duly inflating them. Previous to their being stall-fed, they have, when slaughtered, lungs small posteriorly. It is also certain, that if an animal dies well, the lungs will be found disproportionate to what they must have been in the living animal.

I do not agree with the generally received opinion, nor with Dr. Lyon Playfair, that the lungs must be of necessity small when an animal first begins to fatten; but, as the fattening process goes on, the internal cavity of the chest becomes smaller, the action of the heart weaker, and the lungs diminish in size in a regular gradation from various causes; first, from limited expansion; secondly, from absorption, and by pressure of the surrounding parts; and, lastly, from quietude never allowing their due inflation, which the act of depasturation affords.

The liver is also found small. This I consider to be from absorption and internal pressure of the surrounding organs. The liver has also a diminished supply of intestinal and mesenteric blood, from the appetite not being so vigorous, and less food being eaten, as the animal grows to maturity.

I have known many animals die from accident, that, on inspection after death, have had large lungs and livers. They were in lean condition, but had every good quality for fattening; and I have no doubt would have made prime fat beasts, and whose lungs and livers probably would have been smaller when slaughtered.

I do think that Dr. Lyon Playfair is wrong in the opinion, that small lungs and livers are the best organs for the assimilation of food and fat. I think that the reason why animals become speedily fat in proportion as they approach maturity, is from the arterial action being slow, and the venous circulation impeded from the pressure of the accumulating fat. The arterial exhalents deposit more than the venous circulation can return, or their absorbents take up. Thus the harmony is broken. It is a fact well-known, that very little blood of the venous kind can be taken from the fat animal. From what I have stated, taken collectively and in conjunction with the primeval external conformation of the animal, may be deducted those determinations which tend to either the formation of fat or muscle.

The tendency of certain articles of food to fatten stock, and the suitability of others to keep up the general growth, afford a fruitful field for inquiry. I shall begin with those that favor evolution of growth. A series of substances that are charged with albumen or a vegetable gelatine, are nitrogenized in the maximum:—barley, oats, peas, and beans, form examples. These substances, having much nutritive matter, make the best food for the purpose of general growth, with the various herbivorous food for the young animal; but the more such food ap-

proximates lignin, the more insoluble and innutritious it is.

Herbivorous food for the young animal is naturally required, from its abounding with several elementary principles, as ammonia, &c. in unity with earthy matter; which, taken in with the food in depasturing and uniting with the inherent formation of phosphoric and muriatic acid (and the phosphoric acid in the farinaceous food,) form the phosphate and muriate of lime. Wheat, with the gelatine of the farina, constitutes the formation of bone; hence the necessity, or rather advantage, of supplying the growing animal with such a material.

The next series of substances are those which contain the saccharine principle, and are nitrogenized in the minimum. They are disposed to the formation of fat. They consist of the different sorts of bulbous or esculent roots, as turnips, mangel, beet, &c. These substances, when mixed with the nutitrive matter of the farinacea, constitute the essential compound necessary for the production of fat and muscle in the animal body.

The table subjoined is one of equivalents, by the celebrated chemist, Brande, showing the relative quantity of albumen and other matter in leguminous and bulbous food.

100 Parts.	Soluble Nutritive Matter.	Starch.	Vegetable Fibrine or Albumen.	Saccharine Matter.
Barley	92	75	10	7
Oats	75	60	13	2
Beans	80	52	25	3
Acorns, 2 months dried	69	40	27	2
Swede Turnip	6½	½	1½	4½
Common Globe	4¼	¼	½	3½

This table is practically one of my own, as to the quantity of nutritive matter in the acorn. On reference to it, any one will quickly perceive those bodies which dispose to make fat or flesh: thus experience has shown the decided advantage of giving to animals bulbous roots, with those substances rich in albumen, when they are preparing for the butcher, and when growth is requisite to be freely allowed to the young depasturing beast. Gelatine, a substance naturally abundant in the vegetable creation, is also a chief ingredient in the animal tissue.

The scientific agriculturist will discover the best method on reference to the table. As far as philosophy teaches, those substances that have the property either of forming fat or muscle, are the azotized and non-azotized food in their relative proportions. The disposition of certain breeds to make fat internally, and of others externally, is a physiological fact, which can only be explained on the principle of those breeds acquiring such a disposition hereditarily, or it may be from the animal possessing such an aptitude from the method of feeding in conformity with the selection of food. Now the breed of the South Devons are coarse, bony, large animals, and not disposed to make fat on the superfices of the body, but more internally: the North Devon is a small-boned and kindly animal, and disposed to fatten either externally or internally. A North Devon is a bad handler, with other points good: physiologically, we should infer that fat would be deposited internally, from the skin being thick and inelastic, showing the absence of those tissues that are for the reception of fat externally. Suppose we have a South-hammer, a good handler, with a mellow and plastic skin, and every other denotation of being disposed to fatten, the probability is, that the fat would be deposited externally. In my humble opinion it is so with every other breed. We must attend more to the external form and quality, in conjunction with locality, climate, and soil. Guernseys or Alderneys make fat but very indifferently externally. I well know practically, that an animal of either breed, with a good skin and good bone, &c. is inclined to fatten on the outside; but, when such is the case, there is an absence of it internally. The circulatory system, with the local form of an animal, may also be reckoned amongst those causes which tend to balance the fat indiscriminately either inside or out. Say that an animal kindly disposed to fatten has a few points that preponderate; for instance, he is large over the sirloin—the blood vessels, nerves, and muscles of such a part take on a corresponding size. When he begins to have more food given to him, the circulatory system becomes more full of blood, and, as a natural consequence, the larger parts have a greater influx of blood—thus the growth of these parts either in fat or muscle, and they become of larger proportions, and deposit more fat than those which are not commensurate in vascular action.

Before concluding these remarks I beg to offer an opinion respecting small lungs, as stated by Dr. Lyon Playfair (at a meeting of the council of the Royal Agricultural Society) that they are more favorable to the formation of fat. Dr. P. says, horses have large lungs. I well know, and not speculatively, that horses, if fed on meal and potatoes, or turnips, quickly and rapidly make fat. In fact, this is the compost that horse dealers use to puff up the farmers' cattle, so as give them a glossy and plump look previous to sale, and the being put to work in this state oftentimes causes their death. On opening them, I have seen them loaded with fat.

Now this is not in accordance with Dr. Playfair's views. My firm conviction is, that animals with small lungs in their growing state will in proportion suffer in their external form. From observations I have made on animals of divers breeds, I have come to the conclusion, that they make fat internally or externally, regularly or irregularly, in accordance with the organization in structural arrangement, linked with those grand principles that modify the external conformation of every animal, locality, clime, and soil; and, lastly, the manner in which beans and acorns harden the flesh of animals. That they do so is an undisputed fact. The hardness of flesh or muscle depends on the richness of its lymph or fibrine. Beans and acorns contain large quantities of vegetable albumen compared with any other food given to horses or cattle. It is on this account, that food which contains a large share of albuminous constituents, when given to horses, cattle, or pigs, makes them develop so great a degree of muscular firmness; but when substances rich in starch, mucilage, gum, or the saccharine principle, are added to beans or acorns, the hardness of the flesh becomes lessened, and the fat more emollient. I have pratically proved this with horses. I have given beans and acorns to horses with hay-chaff on the farm. The muscular power has been augmented, the flesh feels hard, they work well without fatigue, do not perspire, and, in fact, they are in full vigor. I have altered

their diet, and given, instead of chaff, turnips, either the Swede or common Globe, and the effect is soon visible. The flesh becomes soft and puffy—little work excites perspiration—in fact, the animal is soon reduced from a state of good firm condition to one bordering on debility. From the taking away those substances, beans or acorns, which possess in a maximum degree the richest albumen, and the supplying those that contain it in the lowest degree, or minimum, the albuminous principle exists in several forms; and by it the living materiality of the animal body is by a law of animal chemistry built, under the guidance of immateriality.

[Veterinarian.

ST. JOHN'S-DAY RYE, AND LUCERNE,

HOW TO BE CULTIVATED FOR EARLY GREEN FOOD,

THE economy of American Husbandry, is, according to our observation, in few things more deficient than in the common failure of farmers to take measures of precaution to have an early supply of green food for their stock, and especially for their work horses and milch cows, at that most trying and equivocal season of the year, which falls in just between Winter and Spring; and which is yet neither the one nor the other as respects temperature or vegetation; for even though the crop of hay, and of fodder, may be reasonably abundant, and sufficient, in ordinary years, to last until "grass comes;" yet if the Winter should happen to be unusually protracted, it becomes impossible to eke out their fodder until that time does come. In that case the cattle are turned abroad to glean a scanty supply of half-opened buds in the woods, and of young grass which is insufficient in quantity, substance and nourishment. This is the time, and this the occasion, for the sagacious Farmer to manifest his judgment and forethought. In later Spring, and midsummer, any sort of a manager may have sleek horses and fat cattle; but the sign and the honor of good management consists in maintaining them in uniform condition, or nearly so, throughout the year. "*Well wintered—half-summered*" is the motto of all good stock-masters. Thus it becomes important to determine the surest substitute for short crops of hay, and the most succulent, natural and wholesome food for Spring, even though hay should be plenty. The best reliance within our knowledge for a very early supply of green food, coming two weeks sooner than clover, is *Lucerne* and *Rye*—both these have we advocated repeatedly, through other channels, but, unfortunately, no class of people require to be so often reminded and urged to any new and untried expedient, as do agriculturists—not that they are not quick enough to catch a humbug as it flies along, as one of some sort does every year, generally in the Spring, such as calico-corn, California tobacco, Rohan potatoes, &c. &c., but the trial of these requires no great effort, and involves but little additional labor. Very different is it when it is proposed to try an altogether new crop, for a particular purpose, demanding care in the preparation of the ground and otherwise a considerable departure from the usual routine.

Failures in a large portion of the few attempts that have been made, as far as we know, to employ *Rye* as a *green crop* for soling horses and milch cows, at least until the clover is sufficiently advanced to take its place, have doubtless been owing, in most instances, to *want of care in manuring and preparing the ground*, by reducing it to the finest state of pulverization, and in not sowing early enough. The same may be said of Lucerne—some contend that Lucerne is apt to fail from the dryness of our Springs; though this may happen the first year, yet as it is known to send down a longer and larger taproot than any other grass, and as all accounts, as well they may, on that account, agree that it requires a subsoil free from standing moisture. It is probable that even crops of Lucerne which present the most unpromising appearance at the close of the first year, might yet prove highly profitable subsequently, and for many years, as we have known them to do, and especially if suitably top-dressed. Having yet seen nothing to shake our confidence in the value of these grasses, if we may call them such, we shall persist in recommending them, and in enforcing our impressions by such illustrations as we may find in American and European Agricultural journals.

What we have here said is but preparatory to the re-publication of papers from foreign periodicals of late date, in which both *Lucerne* and a peculiar kind of *Rye* are recommended in the strongest terms for the purposes above named. What there may be peculiar in the "St. John's-day Rye," we know not, except from what is

said in these papers, but the patrons of the Farmers' Library may be assured that effective measures shall be taken for the importation of small quantities, sufficient for trial, in this and in all similar cases, to be distributed among them as soon as we can get time to make the arrangements. In this country it is known to us that, as in England, Lucerne requires that the ground to be dry and *clean*, and we should think it probable that it might answer to sow it with rye or oats, which might assist it in keeping down the weeds the first year, where it is decided to sow it broad-cast, as we have known it to be done, with satisfactory results; but no farmer who drills it will grudge the time given to keep it clean the first year; at all events it cannot interfere injuriously or inconveniently with any but a *planter*, and even he should try it on some scale. Though there may be nothing very new in these Essays to those who have paid attention to the subject, even they may here have their attention re-drawn to the matter in a way that may at least have the effect of prompting a trial, but, small or large, let it be a *fair one*. Let the ground be well manured, as it should for every crop, but in this case with either well-rotted manure, or with bones, ashes, or guano, as being the cleanest. Let it, furthermore, be made clean and fine, and sowed [we believe] about twenty pounds of seed to the acre of Lucerne; or, if Rye, let the ground be, in like manner, thoroughly well manured and put in fine tilth, and sowed as recommended in these Essays, and we will venture to predict the most gratifying result. If the conditions are complied with, and the experimenter is disappointed, the Farmers' Library shall record the false prophecy:

ON THE ST. JOHN'S-DAY RYE.

BY PH. PUSEY, M. P.

THE late Lord Leicester advised that no farming experiment should be published until it had been successfully tried for three years.—But though I have not grown the St. John's-day Rye as yet even for two complete years, its promising appearance, and the approval of neighboring farmers, encourage me to lay a short account of this plant before the Society.—It was in 1842 that Mr. Taunton, of Ashley, near Stockbridge, first made it known to me in the following terms:

"In your digest of the progress of agricultural knowledge, you say, of early Rye, that 'some farmers do not approve of it; for while young it gives but little food, and it shoots up rapidly to a harsh stalk, which stock do not relish.' But this reproach does not apply to the variety of Rye which is the best worth cultivating, and, as I think, the only one worth cultivating to any extent for the purpose of green meat—namely, the St. John's-day Rye, *(seigle de St. Jean.)*—This plant, if sown in proper time, and on a suitable soil, presents itself to the scythe in a state palatable to horses for full three weeks, or more. I would sow not more than one-fourth of the ground with common Rye by the side of it, for the common Rye is a very few days earlier, and, by the time when that becomes harsh and woody, the St. John's-day Rye has attained its perfection. Of this latter I have had, on a suitable soil, to the extent of 11 London loads of straw per acre, when left for seed; for it will grow from 6 to 7 feet high. The time to sow it is the 24th of June; at all events get it in before July. The soil for Rye ought to be a siliceous soil; it does not reject a considerable admixture of clay, but it ought to come under the description of a sandy loam. If you want such a burthen as I have described, of course the condition of the soil must not be poor, and such produce will pay for good land. The soil, too, needs to be compressed after sowing, if the land be at all light, by rolling or sheep-treading; otherwise the Rye-plant is peculiarly obnoxious to the wire-worm. The mass of foliage in October would induce you to feed it then; but I would recommend you to abstain: the leaf (unlike Winter barley) is very little changed by the Winter, and it so cherishes the young foliage, which shoots up in Spring covered with this dense mantle, that it will repay your forbearance with ample interest. I have seen it in the end of February, or beginning of March, equal, if not superior, to the best water-meadow for ewes and lambs; for soiling in stable, the horses will eat it when the ear is fairly developed—and it may, perhaps, be 5 feet high, (according to the soil;) it will have tillered so much that the produce will be a very heavy one."

In June of the following year (1843) Mr. Taunton sent me another account of his further success in the growth of the St. John's-day Rye:

"I enclose to you a stalk of my St. John's-day Rye, length 6 feet: it has not yet flowered. I began to soil eight cart-horses with it on the 13th of May, then 3 feet high, and four cows a week later. Both these kinds of stock still eat nearly the whole of it, with scarce any waste; so that it has now been twenty-two days in use, and I expect that they will eat it freely some days longer: thus, you see, extending its eatable state nearly to a month. If I had possessed a greater breadth of this crop in the present season, I should have begun a week earlier, not waiting till it had attained the hight of 3 feet.

"The ground which bore this had a dressing of dung just before sowing. It succeeded wheat, cut green into stable; but your calcareous grit detritus is a far more favorable soil for Rye than our chalk.

"This plant, and, I believe, this variety, proved fatal to hundreds of our brave men on the sandy plains of Belgium, two days before the battle of Waterloo. They marched through fields of it higher than their heads. The glittering points of their bayonets marked the track of their march to the enemy's artillery, which was on an eminence, while the Rye being higher than their heads, they could see no enemy, and knew not whither to direct their fire."

Mr. Taunton having presented me with some seed of this Rye, it was sown in the course of July, 1843, on some poor moory soil, without manure; was fed off in the Autumn, and again in the Spring; yet produced, on little more than a quarter of an acre, 13 bushels of seed. That seed was sown again last year in August, as soon as harvested: it produced on a sandy loam very good feed in the Autumn, and in this backward Spring it realised Mr. Taunton's description, and established its character here by cov-

ering 4 or 5 acres with a thick coat of herbage, in which the lambs were browsing breast-high, while there was little or no other feed in the neighborhood. I find, too, in the late Mr. Rham's Dictionary of the Farm, a yet more favorable account of it. Under the article Rye, in that convenient little book, our lamented colleague observes: "There is a variety of Rye mentioned by continental authors by the name of St. John's-day Rye, because it grows so rapidly that if sown about St. John's-day it will be fit to mow green by the middle of September; and in favorable seasons may be fed off again in November without preventing its giving ample feed in Spring, and a good crop of grain at the next harvest. It might be advantageous to introduce this variety into England, if it be not already known." On the other hand, it is right to state that, when our seedsman, Mr. Gibbs, inquired respecting it in its native country, he was informed that its cultivation was not spreading in Belgium. But the reason assigned was its inferiority to the common Rye in yield of seed; and this objection, though valid in countries where rye bread is eaten, will not apply where, as in England, Rye is intended principally for green fodder. Although then, as I said, my trial of the St. John's-day Rye is incomplete, and though it has not been sown here as yet on its peculiar day, it has evidently two advantages over the common Rye. It tillers so much as to produce double the quantity of herbage on the same space of ground. Indeed, in one field where the two varieties were growing together, the common Rye, after twice feeding off, became so thin that I plowed it up; while this new Rye covers the ground with its third crop as with its first. Besides tillering more, it is also sweeter than the common rye when young. Where they grow together, the hares and rabbits, while we had any, ate it before the other. Its principal merit, however, is its superior sweetness in advanced growth, and the consequently longer time during which it remains fit for use as spring feed. Good farmers who have seen it agree with me, that this new Rye should be tried upon such light hollow soils as we sometimes find on our southern chalk-hills. On such land, in dry seasons, farmers often lose their turnip crop after it is singled out; but Rye is known to bear well such looseness of soil. If it were sown instead of turnips, or where the turnips had missed, on a part of the turnip-land, even one green crop in the Autumn, to say nothing of two, and another in Spring, might compensate for such a crop of roots as this land generally yields. If it stood for seed afterwards, it would then also take the place of the barley crop—the turnip's natural successor; and the rotation would remain undisturbed. I will only add one suggestion, or rather call attention to a statement of Mr. Taunton's, that if the St. John's-day Rye be left uneaten in the Autumn, it will afford feed for ewes and lambs equal to the best water-meadow, as early as the beginning of March or the end of February—an invaluable time for such feed. All that is hoped of a new plant is seldom realised in practice; but what I have myself seen of the St. John's-day Rye, and the opinions of farmers who have also watched it, make me sure that I should not be rash in advising occupiers of light lands to give it a trial, but that unfortunately, as I am informed, no seed is now to be procured abroad with a certainty of its genuineness.

Pusey, May 12, 1845.

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ON LUCERNE, AND THE PREPARATION OF THE LAND.

BY J. TOWERS.

THE more we see of Lucerne, the more have we cause to be delighted. In Thanet, and such chalky districts, it forms the chief article of green fodder, for upon such soils meadow-grass will not thrive to perfection.

The land which the plant affects is a rich, mellow loam, not very heavy, but unctuous, reposing upon a chalk rock, at a foot or more below the surface: but Lucerne will prosper well in any good garden soil, and continue in heart for eight or ten years, yielding, in showery seasons, five, six, or seven cuttings every season, provided the foolish, unremunerative practice of leaving the herbage to stand till the flowering be abandoned.

I propose to treat of the culture of Lucerne experimentally, after assuming that it is essentially a lime plant, since it has been found that the ashes contain, of phosphate of lime, 13 per cent.; chalk, or calcareous matter, 50 per cent.

If these be only approximations, we are taught thereby that lime or its combinations form the specific and appropriate manure; and, therefore, that in any inland county on the south side of Yorkshire, there can be little difficulty in securing a great return for comparatively a moderate degree of labor and attention.

I shall suppose a case which is of common occurrence—that of an old pasture, foul with meadow crowfoot, *(ranunculus acris.)* dandelion, &c., which requires to be broken up. The *land must be cleaned*, and this is best effected by paring and burning, by which myriads of the wire-worm may be destroyed, and some alkali and calcareous matters produced, in the form of ashes. These ashes are to be scattered over the pared surface, and then the ground should be trenched two good spits, or eighteen inches deep. At the bottom of each trench, and again over the first returned spit of earth, a two or three-inch stratum of street or spit dung, or of prepared *cloacene*, should be laid. By prepared cloacine, I mean the contents of a privy, mixed with twice or thrice the volume of loam or good earth, over which has been sprinkled two or three gallons of diluted sulphuric acid to fix the ammonia. This compost, after standing six months and being once turned and mixed, would prove an excellent phosphated manure.

When the trenching is completed, a further dressing of dissolved bones should be given in the following manner: For the half of an acre, take one bushel and a half of true bone dust, one-third of its weight of concentrated sulphuric acid, and three times its weight of water. Put the last into an open tub, pour into it gradually the sulphuric acid, stirring with a wooden oar, then add the bone dust. Stir from time to time, till the mixture assume an uniform consistence, and it will consist of sulphate of lime and phosphate of lime, with an excess of phosphoric acid. Incorporate with it so much dry, sandy earth, saw-dust, or fine coal ashes, as will bring it to the temperament of moist garden mould; then deposit it in heaps on the land, and when pretty dry, scatter it over the ground; after which, fork the surface, and sow the seed as the work proceeds.

If, however, the land be somewhat foul with root weeds, it will be better to crop the whole piece with potatoes in the first Spring, omitting

the bone dress, and to harrow or thoroughly rake the land once or twice; after which, the hoeings required during the growth of the potatoes, and the digging up of the crop, will pretty effectually clean and prepare the soil, especially if it be set up in high ridges during Winter.

Lucerne seed costs about 1s. or 1s. 3d. per lb. I have steeped it in nitro-sulphates, in order to try their efficacy, and have also on the same day sown the unprepared seed, employing artificial heat; and both have germinated alike. All pasture seeds ought to be so tested, because of existing frauds; but if the sample be proved good, five or six pounds will sow half an acre, provided the rows be 12 or 14 inches apart, but some recommend 8 or 9 inches. The drills are not required to be more than an inch deep, and the seeds should not be thickly deposited. The best season is mid-April; but June, if showery, will do well. The germination is rapid; and when the plants are safe from the first assaults of insects, (lime dust is a preventive remedy,) they should be thinned to three-inch distances at first, and subsequently to six inches, surface-hoeing the plot with the spad or Dutch hoe.

It is astonishing how productive the plant becomes during the first Summer, provided the weather be showery, with intervening periods of warm sunshine. I have cut six or seven swarths of fine, lush herbage, between an April sowing of the seed and the end of the following October; and have found the part first cut ready for the scythe again by the time that the cutting was completed.

During the course of the first Summer, the land should be kept perfectly clean; it will also be prudent to cut but twice, and then only when the plant shows its blossom *buds*, never suffering a seed to form, nor, indeed, the flower to expand. It is the chief object to obtain a strong and vigorous crown in the early course of the plant's growth; and this is done by leaving it to attain that maturity which is indicated by bloom: if cut in the first instance, while purely succulent and immature, the same debilitating effect might result which would be produced by cutting-over a fresh plot or bed of very young asparagus; for both plants produce crowns, which form round the first collar and much extend its bulk. In fact, if Lucerne be thinned out to six-inch distances, the entire spaces will shortly be filled up by lateral developments.

The hoe ought to be very effectually used so soon as every portion is cut, in order to exterminate weeds, and particularly tufts of grass; or in lieu of the hoe, a two-pronged bent or drag fork, with broad tines and a long handle, would be found a very effective tool. The *habit of growth*, with strong, deep roots, and extending crowns, indicate plainly that sheep should never be suffered to depasture the autumnal herbage, for their bite is so close that numbers of the best plants would be sacrificed. Therefore, at the final cutting of the season, which ought not in general to be made later than the middle of October, the ground between the rows should be hoed; and when Winter sets in, a dressing of fine coal-ashes mixed with bone-dust—nine bushels of the ashes to one of the bones, for every half-acre—will prove very beneficial to future growth. Gypsum might be added to the extent of the bones, and this would give more quality to the ashes, which frequently contain about one-tenth part of sulphate of lime; the remaining nine-tenths being chiefly impure silex, with a little iron.

If *Lucerne* have been sown in deeply prepared and enriched earth, dung and putrescent manures as top-dress are seldom required; whereas good *inorganic* manures tend to keep the surface-soil pure, light, and free from weeds.—This is of consequence, as otherwise, when once tufts of grass obtain possession, patches will speedily occur, and the compact beauty of the rich herbage will disappear.

I have lately inspected a small piece, that I remember to have observed eight or ten years since, then growing and producing abundantly from April to November; the rows are above fourteen inches asunder—the plants in perfect order, and in straight rows, not a blank visible, and so high as partially to fall over and conceal the spaces. It was under the scythe during the first week of the present May, and was evidently carried away in detail for green fodder. The bulk was enormous; and during a season of alternate periods of rain and fine weather, this small plot, scarcely, perhaps, of twenty poles, will yield an ample supply for a cow.—The soil is now a blackish mould, full of vegetable matter, and it is kept hoed as the rows are mown.

This plot is situated near the termination of the old town of Croydon, leading from the church to the Brighton road, and is almost surrounded by dwelling-houses.

Now, as a small piece in a town can be kept in full bearing during ten years, what might not be done with a few acres among the dairy-farms of England and Ireland? Farmers shirk the *trouble of* the *hoeing;* but such mistakes, and a neglect of their own real interests, is in this, as in but too many other instances, but too apparent. There is not a plant which, if prudently prepared for, and skillfully managed, will so amply remunerate as *Lucerne*. It wants calcareous phosphates, with a good staple loam, which, if sealed upon a chalk bottom, will be thereby improved: with these, its cultivation is most simple, and the labor required is not more than that of a crop of *ridged* and properly grown turnips.

May 15th. J. TOWERS.

Cape Wool.—Of the Cape Wool nothing now remains to be said; it has taken its place in the grand market of Europe amongst the best, and may soon be the first in the first rank, for the Cape climate and natural grasses seem ordained to bring the merino breed of sheep to perfection. This article of export has increased in the following proportions: In 1824, 23,049 lbs.; in 1834, 143,883 lbs.; and in 1844, 2,233,946 lbs. The rate of increase in New-South Wales for similar periods of ten years, when the quantities were not far from those of the Cape, down to 1835, was as follows: In 1815, 32,971 lbs.; in 1825, 411,600 lbs.; and in 1835, 3,893,927 lbs. Thus, in the last period of ten years at the Cape (1834 to 1844), the quantity of Wool increased about fifteen times. During a similar period of ten years at New-South Wales (1825 to 1835), the increase was only about nine times. Such are the powers of the country bountifully bestowed on the inhabitants of the Cape of Good Hope.

[South African Commercial Advertiser.

NEW-YORK STATE AGRICULTURAL FAIR:

TO BE HELD AT UTICA, SEPTEMBER 17TH, 1845.

WE are indebted to the politeness of Mr. TUCKER for the following account of the proceedings of the New-York State Agricultural Society, in reference to the Exhibition to be held at Utica on the 17th September inst.

The public will be gratified to learn that the Annual Address is to be delivered by JOSIAH QUINCY, Jr. *Our* anticipation of enjoyment is none the less from the recollection of having heard him with admiration deliver his commencement oration at old Harvard.

NEW-YORK STATE AGRICULTURAL SOCIETY.

The meeting of the Executive Committee of the State Agricultural Society for August, was held at the Society's room, in Albany, on the 14th. Present—

B. P JOHNSON, of Oneida, President.
E. P. PRENTICE, Vice-President, Albany.
ALEXANDER WALSH, Rensselaer.
GEORGE VAIL, Rensselaer.
THOMAS HILLHOUSE, Treasurer.
LUTHER TUCKER, Recording Secretary.

Letters were read from Hon. Wm. H. Seward, Auburn; Hon. Luther Bradish, New-York; Hon. Josiah Quincy, Jr., Boston; Isaiah Townsend, Albany; James Gowen, Esq., Philadelphia; James S. Wadsworth, Geneseo; Francis Rotch, London; James Taylor, Birmingham; Hon. John Savage, Salem; Lewis F. Allen, Esq., Buffalo; Paris Barber, Homer.

The Board proceeded to complete the list of Judges to award the Premiums at the next State Fair. The following are the

JUDGES TO AWARD THE PRIZES.

Cattle, Class I.—James Gowen, Philadelphia; J. S. Skinner, New-York; Thomas Hollis, Gilbertsville.

Cattle, Classes II, III, IV.—Adam Furguson, Watertown, C. W.; F. Ingersoll, Vernon; D. D. Campbell, Schenectady.

Cattle, Classes V and VI.—J. R. Speed, Caroline; Wm. Fuller, Skaneateles; Aaron Petrie, Little Falls.

Working Oxen.—Sanford Howard, Albany; Andrew J. Bell, Lairdsville; Squire M. Brown, Elbridge.

Steers.—E. P. Peck, Sheldon; Clift Eames, Rutland; Israel Boies, Homer.

Fat Cattle and Fat Sheep.—Ela Merriam, Leyden; Lester Barker, Clinton; P. N. Rust, Syracuse.

Stallions.—J. M. Sherwood, Auburn; Wm. Jones, Queens county; Edward Long, Cambridge.

Mares and Colts.—Anthony Van Bergen, Coxsackie; Willard Ives, Watertown; F. P. Bellinger, Herkimer.

Matched Horses.—Wm. Salisbury, Leeds; Duncan Robinson, Fishkill; H. S. Woodruff, Auburn.

Sheep, Class I.—W. A. S. North, Duanesburg; Robert Musson, Gilbertsville; Jas. Parker, Jr., Trenton.

Sheep, Class II.—S. Waite, Jr., Montgomery; W. H. Sotham, Albany; Lyman Sherwood, Auburn.

Sheep, Class III.—Chester Buck, Lowville; Sam'l Cheever, Stillwater; D. R. Gill, Henderson.

Sheep, Class IV.—J. P. Beekman, Kinderhook; J. M. Ellis, Onondaga Hill; M. Y. Tilden, New-Lebanon.

Swine.—L. B. Langworthy, Rochester; Geo. Webb, Pamelia; Hiram Hopkins, Cortlandville.

Poultry.—C. N. Bement, Albany; T. H. Hyatt, Rochester: Storrs Barrows, South-Trenton.

Vegetables.—D. B. Fuller, Hyde Park; B. W. Dwight, Clinton; H. L. R. Sandford, Volney.

Plows.—George Geddes, Tyler; C. C. Dennis, Auburn; M. L. Brainerd, Rome.

Wagons, Harrows, Cultivators, Fanning-Mills, Machines for cutting corn-stalks, Horse Powers and Threshing Machines, Drill Barrows and Straw-Cutters.—H. S. Randall, Cortlandville; G. W. Patterson, Westfield; Myron Adams, East Bloomfield.

All other Agricultural Implements.—Pomeroy Jones, Lairdsville; John Williams, Jr., Salem; T. R. Hussey, Auburn.

Butter.—E. W. Bateman, Venice; Z. Barton Stout, Richmond Hill; Elijah Rhoades, Manlius.

Cheese.—T. C. Peters, Darien; Thomas Burch, Little Falls; Harrison Blodgett, Denmark.

Sugar.—O. Hungerford, Watertown; E. Mack, Ithaca; George B. Rowe, Canastota.

Silk.—Alexander Walsh, Lansingburgh; Samuel Thompson, Utica; John Walsh, Albany.

Domestic Manufactures.—Judge Conkling, Auburn; Roswell Randall, Cortlandville; Le G. Cannon, Troy.

Fruits.—J. J. Thomas, Macedon; Chas. Downing, Newburgh; P. Barry, Rochester.

Flowers.—Prof. Jackson, Schenectady; Benjamin Hodges, Buffalo; Charles Tracey, Utica.

Plowing Match.—Lewis F. Allen, Buffalo; N. S. Wright, Vernon Centre; E. Marks, Tyler; William Ottley, Oak Corners; John Johnston, Geneva.

Miscellaneous and Discretionary Premiums.—Thos. Farrington, Owego; B. N. Huntington, Rome; Joel Rathbone, Albany; J. J. Viele, Lansingburgh; Oliver Phelps, Canandaigua.

TRANSPORTATION OF STOCK.

The Committee on this subject reported that arrangements had been made with the different Railroad Companies, whose officers, with their usual liberality, had agreed to transport, *free of charge*, all animals and articles designed for exhibition at the Fair.

Gentlemen who intend to send their stock by the Railroad, must give notice at least one week previous to the Fair, to LUTHER TUCKER, Albany; M. D. BURNET, Syracuse; J. M. SHERWOOD, Auburn; L. B. LANGWORTHY, Rochester; and L. F. ALLEN, Buffalo—so that the necessary preparations may be made by the Companies for their transportation.

They farther reported, that extra trains would be run, in which visitors to the Fair will be carried for a sum not exceeding half the usual rates on the roads. Of their times of starting, notice will be given as soon as the arrangements are completed. The Packet Boat Companies have made arrangements to facilitate the conveyance of visitors at reasonable rates.

It is expected that the operations of the Magnetic Telegraph will be exhibited on the grounds during the Fair. It is intended by the proprietors of this work to have it ready for operation from Utica to Little Falls, a distance of twenty miles.

Articles designed for exhibition at the Fair, may be directed to the care of Farwell & Harrington, Utica, who will take charge of them as directed by the owners.

REGULATIONS FOR THE FAIR.

All members of the Society, and all who may become members at the time of the Fair, by the payment of $1, will be furnished with Badges, which will admit the person and his wife and children under twenty-one years of age, to the exhibition at all times during the Fair. Tickets to admit a single person, 12½ cents.

Members will be allowed to enter in carriages with their families, but no hacks or other public conveyances will be permitted to enter, except when the inmates are members of the Society, without paying $1 for each entrance, and the inmates, if not members, to furnish themselves with tickets.

Gentlemen may become members and obtain Badges at the stage-office of J. Butterfield & Co., and at the bookstores of I. Tiffany. G. Tracey, Bennett, Backus & Hawley, Genesee-st., Utica, or at the Business Office at the Show-Yard.

All exhibitors at the Fair must become members of the Society, and have their articles entered at the Business Office before taking them into the enclosure.

All those who intend to compete for the Premiums on Agricultural Implements, Butter and Cheese, Sugar, Cocoons, Silk, &c., should have their specimens on the ground on the 16th, that they may be deposited in their appropriate places, and the rooms suitably arranged on the day previous to the Fair.

No premiums will be paid on animals or articles taken away before the close of the Fair.

Every thing intended for the exhibition, must be on the ground at or before 9 o'clock, on the morning of Wednesday, the 17th.

Animals and other articles offered for exhibition, must be labeled with the owner's name and residence at full length.

THE COMMITTEES TO AWARD PREMIUMS.

The several Committees to award Premiums, are requested to report themselves at the Society's room, at Bagg's Hotel, on Tuesday Evening, the 16th, or at the Business Office on the show-grounds previous to 10 o'clock on Wednesday morning, the 16th, after which all vacancies will be filled, and the Committees will enter upon their duties at 12 o'clock.

The Judges are requested to furnish their awards to the Recording Secretary by 12 o'clock on Thursday, that a list may be made out from which the Treasurer can pay the prizes immediately on the Reports being read from the stand.

The Judges will not award the prizes offered, unless in their opinion the animals or articles exhibited are worthy of the Premiums.

Prize animals and implements at the previous exhibitions, will be allowed to compete for the prizes; but they must receive a higher prize, or in a different class, to entitle them to a Premium. Should the same Premium heretofore given them be awarded, they will receive a Certificate to that effect instead of the prize.

No Viewing Committee, with the exception of the Committee on Discretionary Premiums, shall award any Discretionary Premium, without the previous permission of the Executive Board, expressed through their President.

The Annual Address will be delivered, under the large tent, at 3 o'clock on Thursday afternoon, by Hon. JOSIAH QUINCY, Jr., of Boston.

Immediately after the Address, the Reports of the Committees to award the Premiums will be read, and the Premiums paid at the Treasurer's office. The Treasurer will also be in attendance at the Society's room, at Bagg's Hotel, on Thursday evening and on Friday, for the purpose of paying Premiums.

On Thursday afternoon the Premium animals will be exhibited on the grounds, separate from the others, with cards showing the Premium awarded to each animal, so that the public may have an opportunity of viewing the animals which have been adjudged worthy of the Premiums of the Society.

COMPOSITION OF SOILS.—Now, through the labors of Sprengel chiefly—not solely, for he had predecessors and contemporaries also, though less laborious, and less clear and decided in their opinions than himself—it has been established regarding soils—1. That they all contain a certain proportion of organic, chiefly vegetable matter, which readily burns away when they are heated to redness in the air. This combustible matter in peaty soils sometimes amounts to 50 or 60 per cent. of the whole weight; while in clay soils, such as the white undrained clays of Lanarkshire, less than one per cent is present. 2. That in all naturally fertile soils, the incombustible part contains a notable quantity of each of 10 or 11 different mineral substances. 3. That soils in which one or more of these substances is either wholly wanting, or is not present in sufficient quantity, will not produce good crops. 4. That to these latter soils what is wanting may be artificially added, and that thus their fertility may be increased, restored, or maintained. 5. That some of these substances, when present in excess in the soil, become noxious to the plant; and that, to render such a soil productive, this excess must be, in some way or other, removed. These five propositions comprehend nearly all that is of importance, in regard to the incombustible part of the soil. They are all fully and frequently stated in the works of Sprengel. They are illustrated and enforced in these of Liebig and Johnston. It would interfere with our present purpose to dwell upon the combustible or organic part of the soil. But, with the aid of these propositions, the general doctrine of soils, and the action of saline or mineral manures, becomes so far clear and simple. A soil, to be fertile, must contain 10 or 11 known substances. If any of these be altogether absent, you will improve your soil by adding them to it; if they are present, the addition of them will do no good. If salt, or gypsum, for example, or the ingredients of wood ashes, be wholly absent, you will obtain large crops by adding these substances largely to the soil; if they are merely deficient, a smaller application will be of service; if they are already present in sufficient quantity, any application of them to the soil will be so much money thrown away.

[Edinburgh Review, Jan. 1845.

GUANO.—Have any of your correspondents, in their experience with this, found it to have any influence on the scent of flowers? I have used Potter's Liquid Guano about once a week, to Pelargoniums and the more choice of the tea-scented Roses. The foliage and flowers have been most luxuriant in their appearance, but the fragrance of the rose seems, in some instances, to have been changed even to a most unpleasant odor. Can that arise from the use of Guano? [English paper.

ORATION

DELIVERED BEFORE THE

AGRICULTURAL AND MECHANICS' ASSOCIATION OF LOUISIANA,

ON THE TWELFTH OF MAY, MDCCCXLV.....BY JUDGE P. A. ROST.

Mr. President and Gentlemen of the Agricultural and Mechanics' Association—

In rising to perform the duty which it has been your pleasure to assign to me on this interesting occasion, I am aware that you do not expect from me an academical discourse upon the importance and the dignity of Agriculture.—Planting is not carried on with rhetoric, and if our occupations be worthy of praise, it is in good taste to let others speak it. You want facts, careful observations, and practical results. You are in search of knowledge. I am bound to say that I have little to impart, but I am willing to converse with you on the subject of our common pursuits; to direct you to the sources from which I derive the limited information I possess, and to state the experiments by which I have attempted to apply that information to the Agriculture of Louisiana, and the manufacture of its products. I do not, however, desire you to take my results as rules of action, till you have verified them, and if I can succeed in awakening a spirit of inquiry which will induce you to do so, their accuracy is of no consequence; the discovery that I was in error will be as useful to you, as the certainty that I was not.

In a paper which I had the honor to contribute to the labors of the Association, last year, I stated that the modern improvements in Agriculture were the result of recent and more accurate knowledge on draining, plowing, manuring, and interchange of crops. I then gave a description of the process of thorough draining as practised in Great Britain, and of subsoil-plowing, which is the complement of it. It is unnecessary to revert to the subject here, except for the purpose of stating that this process is being rapidly introduced in the British West Indies, and that it has proved as beneficial there as in Europe; so much so, that, although by the present modes of cultivation, the average of rattoons and plants is seldom two thousand pounds of sugar per acre, it is confidently believed that, in lands thoroughly drained and sub-soiled, the average will be five thousand pounds per acre. I have no doubt of it, and when that system is introduced here, the produce of a depth of sixteen inches of dry alluvial soil cannot be predicted; nobody knows to what size cane may be made to grow, and how much sugar it can yield. But, Sir, the process is expensive and can only be introduced gradually. We must for the present go on with our open drains, and we can do passably well with them, provided we have them not over one hundred feet apart, and not less than three feet in depth; with such drains, made or thoroughly cleaned when the land is planted in corn, the hardest clays, if not too low, will be found in the subsequent years to drain as well, to plow as deep and to pulverize as fine as light soils; they will, moreover, yield greater returns in sugar.

Connected with the subject of draining, is that of draining swamps and low lands, so as to render them fit for cultivation, a subject of high importance, since, besides the vast quantity of public lands of that description in Louisiana, there are few plantations on which the proportion of these lands is not greater than that of the cultivated fields. Some abortive attempts at draining low lands had before been made, but within the last year, a few intelligent planters below New-Orleans have taken the lead in good earnest. Their draining machines are the most perfect of the kind, and they have succeeded in obtaining solid foundations for their locks. After the heaviest rains, they dry their land in an incredibly short space of time, and their crops of corn are now growing in marshes below the level of the tides. Their success establishes the fact that the low lands may be effectually drained in large tracts, at an outlay which, with the Congress price of those lands, would not exceed fifteen dollars per superficial acre.

The food of plants and their modes of existence form the subject of a very remarkable work, that of Justus Liebig, upon organic chemistry applied to Agriculture. Others before him had submitted to analysis trees, plants and the earths in which they grow. Countless results of isolated experiments had been collected, but they were rather perplexing than practically useful, till the master mind of Liebig constructed out of them a rational and simple theory of vegetable life. He had not all the facts necessary to make his theory perfect; he was not aware, for instance, of the action of galvanism and electricity upon growing plants. But he did for Agriculture what Lavoisier had done for chemistry; he systematized what was known, and pointed out to his successors the true path of discovery.—Taking for granted that the substances which are invariably found in a plant, are necessary to its perfect development, he has shown which of those substances were supplied by the earth, by the atmosphere and by rain-water; he has proved that pure vegetable mould, which has been considered as the only agent of vegetation, had in it but a secondary and not an indispensable agency, and that the results assigned to it were produced by carbonic acid, water, and ammonia, or rather nitrogen, and certain mineral salts which the earth supplies; he has discovered that in sugar-bearing plants, carbonic acid is the source of saccharine matter. I cannot enter into a detailed examination of this author's views, but I will attempt to show you some of the results to which his theory would lead in the cultivation of the cane, and you will be pleased to find that the practice of our good planters fulfils all the essential requisites of science.

Sugar-cane, analyzed with great care and in various seasons by Mr. Avequin, a person fully competent to the task, is found to contain in pro-

portions, not material to the present inquiry, the following substances, which, according to Liebig, are supplied exclusively by the earth, acetate of potash, phosphate of lime, silica, sulphate of potash, phosphate of potash, chloride of potassium, acetate of lime. These, as well as carbonic acid, ammonia and nitrogen, are hard names, names new to most of us; we must learn their import. Twenty-five years ago we knew not the meaning of piston and cylinder, of steam-chest and safety-valve. We all know it now; and as the application of steam to the mechanical arts has not wrought a greater change than the recent discoveries in Agriculture are designed to effect, we will have to sharpen our intellects once more and raise them to the level of the times. Upon this, however, I do not at present insist, and if you are disposed to be very obstinate, take the mineral salts I have mentioned, as things which, being invariably found in the cane and never in the atmosphere, or in rain water, should exist in the soil in a state fit for assimilation by plants; your lands must contain in that state, potash, silica, lime, chlorine, phosphoric acid, sulphuric acid and substances yielding ammonia; and should any of these be wanting, they must be supplied by deep plowing or by manure.

As it is well known that cane flourishes equally well on all our alluvial lands, when they are first brought into cultivation, we may assume that all these lands once contained, in a state fit for assimilation, the substances necessary to its growth. There is, therefore, no original deficiency to supply, and wherever the cane has ceased to grow and to rattoon as it once did, it is because those substances have been abstracted from the soil by injudicious cropping.

Knowing the mineral substances which the cane requires, chemists tell us that we might at any time ascertain the deficiencies of our soil, by having it analyzed. The suggestion is plausible, but there is nothing in it; we would be as wise after the analysis as we were before. The learned author already quoted shows that arable lands are the result of the disintegration of rocks during many thousand years: that this process is ever going on at the surface of the earth, and that many thousand years will elapse before it is completed. By this process the alkalies and salts which the earth contains, are gradually set free and rendered fit for assimilation by plants; and when all the substances thus set free have been taken up, plants requiring them will cease to grow in the soil where they are wanting, and yet it will require thousands of years to effect a complete disintegration. The quantity abstracted by the cane in Louisiana, during a cultivation in forty years, must be infinitely small in relation to the quantity yet remaining, and accordingly it is found, where land supposed to be exhausted has been analyzed, that it contains the same elements as the fertile soils adjoining it, or found beneath it, united in very nearly the same proportions. It is not the precise quantity of the different elements contained in our soil, which it imports us to know, but that portion of them which is disintegrated and fit for assimilation; this, I apprehend, chemistry cannot tell us.

If we could every year provide a sufficiency of mixed animal and bagassa manure for all the land we plant, it would be idle to inquire about the deficiencies of the soil, since that manure contains all the requisite substances. But, compelled as we are by the severities of the climate to plant annually a large portion of our crops, we cannot save one-sixth of the quantity of manure required. This should be husbanded with care and placed in rotation on the oldest lands; for the remainder, manure would have to be purchased at an expense which would not be under thirty dollars per acre, and the question naturally presents itself—Is it necessary to incur that expense and the extra labor to which it would give rise? Intelligent planters say that it is not, and science justifies their opinion. If in the lands that have been longest in cultivation, the alkalies fit for assimilation are partially exhausted, it should be remembered that the plow has seldom gone beyond the depth of six or seven inches, and that below that depth is a virgin soil in all respects similar to the original surface soil and deeper than the plow can ever penetrate.—So that if a depth of six inches had yielded a sufficiency of disintegrated alkalies to cane crops during thirty years, there is no reason why the next six inches below should not do the same, provided they can be brought to the surface and kept in good tilth. With the thorough drain system this presents no difficulty, and it can be satisfactorily accomplished with the open drains I have recommended. With those drains, a depth of plowing of ten inches, when the stubble is broken up for corn, will give to the land that cannot be manured, all the substances which the cane requires from the earth but one; it will not give a sufficiency of nitrogen. I stated last year that nitrogen or ammonia could only be supplied in large quantities by manure, and I was not then aware that any but animal manure could effect that object. Further experience and observation have satisfied me that it is supplied in great abundance by a process which has long been followed without any clear conceptions of its mode of action: I mean that of covering the land with peas as early in the summer as the corn crops will permit. One of the advantages of peas as a green crop, is, that they take from the land none of the alkalies which the cane requires, while their powerful system of roots has a tendency to accelerate the disintegration of the soil. But their principal action consists in shading the land, thus preventing the escape of ammonia which the rain water deposits in it, and hastening by shade and humidity the decay going on at the surface and the formation of nitre which ever follows it in warm climates. The leaves and seed of the pea are richer in nitrogen than any other vegetable substance, and the result of their decay is the formation of additional quantities of nitric acid.—The nitre and nitric acid thus formed, as well as the ammonia retained in the soil, yield to the following crop of cane the nitrogen they contain. The method now generally adopted of plowing in the field trash, restores to the rattoons, in a state fit for assimilation, most of the alkalies which the plants took up in their growth; and should more ammonia be wanted, by setting fire to the field trash after a rain, the top part of it is converted into charcoal, which has the power of absorbing ninety times its volume of ammonia. To facilitate this operation, cane ought not to be planted less than six feet apart. What precedes, and with it such frequent movings of the soil as perpetually keep the young plants in an atmosphere of carbonic acid, is the method pursued in Louisiana by all successful planters, and the only material improvements I would suggest to them are those of thorough draining and subsoil-plowing.

There are, however, cheap mineral manures

with which it would be well to try experiments. In hard clay lands, for instance, especially if they are too near the level of the swamp to be plowed deep with advantage, quick lime applied to the corn land at the rate of fifty or sixty bushels to the acre, produces an admirable effect upon the ensuing crops. It is itself one of the substances which the cane requires, and can replace others; aided by a crop of peas it very much increases the quantity of nitre and nitric acid formed at the surface, keeps the land in the finest state of tilth, causes the rapid decay of the inert vegetable substances which accumulate in it during repeated crops of cane, and is thus an abundant source of carbonic acid. Land I limed four years ago was planted again last winter and the cane upon it is the best I have.

Experiments successfully made in Europe induce me to believe that we all have at home a substance possessed of the same qualities as lime, and in a higher degree. That substance is clay when burnt to ashes. I cannot describe the process by which it is prepared; you will find it in a recent publication entitled the "Farmer's Manual." It is sufficient to state that little or no fuel is required, and that one small cart load of the ashes is said to have a better and more lasting effect than eight bushels of lime.—The ammonia which they absorb and retain, more than replaces the nitrification obtained by liming, and the burning disintegrates very large quantities of alkalies. It is to the effect of burning that the inexhaustible fertility of lands formed by the eruption of volcanoes is to be attributed.

Common salt I have also tried with success, at the rate of ten bushels to the acre. It gives to the cane a deep green color, and seems to prevent the growth of grass.

I observed, that covering land with peas caused the formation of nitre. In Europe, nitre and saltpetre are both used upon growing plants, at the rate of about one hundred pounds per acre: it is probable that, sprinkled before the plow, here, when the land is first thrown to the cane, their effect would be similar to that of peas.

Much has of late been said on the subject of Guano, and experiments made in Jamaica prove it to be a valuable manure for cane. Used there at the rate of one pound to every four feet square, or about twenty seven hundred pounds to the acre, it caused cane to ripen earlier and to yield two hundred pounds more of sugar per acre, than that dressed with common manure. Those who made the experiment seem to think that one-third of the quantity used might have been sufficient. Admitting the fact to be so, and supposing the rattoons to last two years, and to yield an additional quantity of two hundred pounds of sugar per acre, which is not probable, an outlay of nine hundred pounds of Guano would, in the next three years, give an increase of four hundred pounds of sugar. Where other manure has to be purchased, as in Jamaica, and costs more than Guano, this increase of product is a material advantage. But where deep plowing and peas do as well as animal manure, the additional product obtained by the use of Guano would not pay for it. An experiment is now going on with it in my neighborhood; if it should make the cane fit for the mill earlier than it usually is, it would on that account be very valuable. In the mean time, I would recommend the use of it to a portion of my audience whom I have, till now, sadly neglected: to you, Ladies, within your realm of fruits, flowers and shrubs. There, as well as in the garden, when applied with intelligence and care, it does wonders, and I beseech you not to neglect the means it affords you of increasing the beauty and the comforts of your homes. When God, for wise purposes, doomed man to waste his energies in conquering physical obstacles, He placed you near him to cheer him in his weary task, to remind him that his toils had a worthy object on earth, and to recall him in his hours of repose to the consciousness of his moral existence. All about his dwelling that has the spirituality of beauty and grace, is by some mysterious tie connected with you, and you have an interest in its preservation. Nurse your flowers, then, as if they were a part of yourselves, and let your favorite plants have a cheerful and happy look.—Above all, do not torment them into fantastic and unnatural shapes; remember that the God who made them, gave each of them, as he gave each of you, peculiar forms of beauty, which knives and scissors cannot improve, and that trimming should be resorted to exclusively with the view to restore and preserve the natural shape of each species, as you resort to the mysteries of the toilet to make the perfections you possess conceal the slight blemishes which may accompany them.

Although, for want of time and of competent knowledge, I have confined myself to the sugar crop, my observations upon draining, tillage, animal manure and peas, may be considered as applicable to the cultivation of cotton also. I would not recommend any course which would further extend that cultivation; but if the same crops could, as I believe, be obtained from half of the land that now produces it, the other half might be employed in raising provisions and other products, such as indigo, hemp and tobacco.

On the subject of interchange of crops, I have nothing to offer, and I will now direct your attention to the improvements proposed in the manufacture of sugar.

Not less than six new methods have been partially tested and are now offered for our adoption. We ought to be thankful for every effort of that kind, and encourage to a reasonable extent those persons, who, in trying to benefit themselves, desire also to benefit us. But planters cannot be expected to incur the great expense which the adoption of most of those methods requires, till they have satisfactory evidence of their entire success. That evidence is yet wanting; there is in all much room for improvement. The process of my friend, Thomas A. Morgan, of Plaquemines, is thus far considered the best, and he is far from claiming perfection for it. The increase in the quantity of sugar obtained by some of the innovators, is principally owing to the fact that they re-boil the molasses. This is done equally well by others in open pans.

A new apparatus, said to embrace all that has been found valuable in the others, is now being constructed at the Novelty Iron Works, in New-York, for Mr. Valcour Aime, of St. James, a gentleman distinguished for his enterprise, as well as for his practical knowledge of the subject.—It may do better than the others, but, Sir, all these new methods have the original fault of the usual process, their authors begin wrong. They commence by creating large quantities of coloring matter in the juice, and then, by a great variety of means, they endeavor to extract that coloring matter first from the syrup, and afterwards from the sugar, and in this, by-the-bye, no-

body has yet effectually succeeded. Let me explain my meaning:

If you cut in two a sugar cane and examine the interior part of it with a magnifying glass, you perceive the crystals of sugar as distinct and as white as those of double refined sugar. The object of the operator should be then either to extract those crystals without altering their color, or, if that be found impracticable, to separate them from the impurities mixed with them, while the juice is in its natural state, and yet contains but little coloring matter. Instead of this, the juice is limed while all the impurities are in it. In separating the feculencies from the juice and uniting them in large flakes, lime dissolves a portion of them and forms with them coloring matter which, we all know, at once discolors the juice, when lime is used in excess. Afterwards heat is applied, either in clarifiers* or in the *grande*;† but most of the impurities found in the juice will decompose and burn at a degree of heat far below the boiling point, say at a hundred and twenty degrees of Fahrenheit. This is shown by the thick scales continually forming in the *grande*. From that degree of heat the decomposition goes on in the clarifier, till the juice is drawn, and continues in the *grande* so long as there are feculencies left.—This decomposition greatly increases the quantity of coloring matter, so that, as the juice is being clarified, it loses in color what it gains in purity: and here, let me show the relative value of the *grande* and of clarifiers as agents of clarification. In the *grande*, if it is well attended to, the skummings are taken up as fast as they rise. A portion of them is removed before they begin to decompose, and the process goes on, so that, before the juice reaches the boiling point, nearly all the feculencies are removed and the source of coloring matter is removed with them.

Clarifiers reach the boiling point much quicker and cannot easily be skummed. The general practice is, to bring them to that point without skumming; to let the feculencies separate from the juice by cooling and by rest, and to wash out the clarifiers every second or third time they are filled. Heat and alkalies acting in them upon the accumulated feculencies of one, two, or three charges, dissolve a much larger portion of those feculencies than they can possibly do in the *grande;* the formation of coloring matter continues during the time of rest, and, accordingly, planters, after repeated trials, generally agree that juice well clarified in the *grande* has a brighter and a lighter color, and makes better sugar than that obtained from clarifiers.

But to return to my subject, the first object of research should be, to find means of clarifying the juice, without creating coloring matter. It is said that presses, something like those used to repress cotton here, have lately been successfully employed in the West Indies, instead of rollers; that the juice obtained is much purer, and that a much larger quantity of it is extracted from the cane. If so, this will be a great improvement, and the first step of the process I would recommend. From juice thus obtained, or even from our own, I have no doubt that all impurities less soluble than itself, may be separated by mechanical means, before heat and alkalies are applied, or at least with a very small quantity of alkalies. All other liquids, all fatty substances and oils, except cotton seed oil, are clarified by very rapid process. Cane juice can no doubt be clarified by similar means, and if this was accomplished, the process of sugar making would be very much simplified. The clarified juice might then be placed in an open evaporator, heated by the waste steam of the engine; then be limed and skimmed if necessary, and concentrated to fifteen or sixteen degrees of the *pese sirop;* then purified by filtration through animal charcoal, if white sugar was wanted, or by rest for other qualities, and finally concentrated in vacuum pans of great power, such pans as Mr. Thomas A. Morgan now uses and which he tells me can only be made in America.

The superiority of the vacuum pan is not universally admitted, and we are told that in France it is superseded by open pans, similar in construction to those called here Mape's Evaporators. However this may be, I cannot help believing that the vacuum pan has many decided advantages over all others; one is manifest; the sugar may be grained in the pan, and the granulation is completely under the control of the operator. He may accelerate or retard it at pleasure, he may carry it so far that sugar will not run from the pan, and will have to be taken out of it; he may so conduct the operation as to increase almost at will, the size and hardness of the crystals. This last is an indispensable requisite, if the practice of draining sugar in pneumatic pans should be adopted. The atmospheric pressure is much too powerful for sugars boiled in any other manner; it breaks and destroys the crystals, and in a very few days sets the sugar to fermenting.

The pneumatic draining of sugar has many things to recommend it; the usual loss by drainage is avoided, sugar is got ready for market day-by-day, as it is made, and it may be bleached by pouring white syrup over it and forcing it through the mass. It is said that the process is attended with considerable loss in weight; but as all that drains from the pans may be boiled over once or twice, it is not easy to conceive how the loss can occur.

One observation on the subject of our buildings. Houses of unburnt brick are of late much recommended to the working classes at the North, and to the settlers in the prairies, as being cheaper, drier and healthier than those built of brick or stone. On reading the description of those buildings, in the excellent Report of the Commissioner of Patents, it struck me that they were substantially the same as the old houses of Louisiana, known by the name of houses *en colombage*. Is it not owing to a change in our mode of building that the present race of our people is not so hardy and as long lived as their ancestors were? In former days no one ever entered one of those ancient houses without finding in it a brace of octogenarians, at least.—With our old houses, old people seem to have disappeared; and to you and me, Sir, who are not quite as young as we have been, it may be of some consequence to ascertain the cause of this phenomenon. I have no doubt it is in a great measure owing to the dampness of our modern dwellings, and though we may not persuade our ladies to return to the primitive architecture which was the pride of their great grandmothers, we may at least adopt it for our laborers, and I will make the trial. The brick houses we have built for the purpose of increas-

* Clarifiers are isolated pans in which the juice is sometimes clarified.

† The *grande* is the evaporator farthest removed from the fire in *Compound* furnaces.

ing their comfort, are the cause of many of the maladies which afflict them.

After reviewing the means placed at our disposal to increase the value of our products and to overcome the disadvantages of climate and the gradual deterioration of the soil, allow me to advert to other disadvantages and dangers which in the opinion of many threaten us with inevitable ruin. Two causes of alarm now exist amongst a large number of our fellow planters: the diminution in the value of our lands which will result from the annexation of Texas, and the destruction of our industry by a reduction of duties on foreign sugars, made before we are in a situation to compete with foreign producers. I am happy to say that I believe we have nothing to fear from either.

A person looking upon the map of America, and perceiving a large portion of Texas south of Louisiana, would naturally suppose that Texas is the better sugar region of the two. But the Louisianian who travels in midwinter through the prairies of that naked land, exposed to the unmitigated fury of North-Westers, soon discovers that he has changed climate, indeed, but that he has not come to regions in which tropical plants love to grow. I have it from a gentleman of undoubted veracity, Mr. John C. Marsh, that he has planted cane five successive years in the neighborhood of Galveston, and that he has never obtained rattoons from it. You may then consider it as a well-authenticated fact, that in Texas, as far south as New-Orleans, cane will not rattoon: the cold of winter destroys the stubble; I do not mean to say that it may not to some extent be cultivated there, but I assert that the competition will be by no means a dangerous one, and that upon trial it will be found that the Red River parishes of this State are better adapted to that cultivation than the greater part of what has been called the sugar region of Texas.

Louisiana must remain the great sugar region of the United States; her climate and her soil are the best, and her geographical position is unrivaled. Reflect, Sir, that almost every hogshead of sugar made here, is shipped without land carriage; that planters can always obtain from New-Orleans, in two or three days, any machinery they want, and that their supplies and their market are both brought to their own door. Compare this situation with that of the Texas planter, and you will admit that there is no room for apprehension.

Among our various schools of politicians, one denies to the General Government the power to protect National Industry against foreign competition, and insists upon a horizontal tariff of duties, or no tariff at all. But that school is not, as I conceive, at the head of our affairs. The power it denies, has been asserted and acted upon by all preceding Administrations, and it is the will of this nation, that it shall continue to be so. The people have a strong instinct of self-preservation; they know the value of our present form of polity, and cannot be seduced into changes. Whether the cry be against the Union, against the Veto, or against the Protection of National Industry, you will see the masses come to the rescue, and uphold the substantive powers of Government. The mental process by which that power first came to be denied, is an instance of what usually occurs when some general principle is first applied to the concerns of nations. Theory at once gives the rule, time and experience alone can supply the exceptions. The French philosophers of the last century had said that all men were born free and equal, and the first act of the rulers of revolutionary France was to take that principle as the base of social organization. But they adopted it without the restraints which alone make it valuable, and crime and anarchy were the results of their oversight. In like manner, other philosophers convinced some of our statesmen that trade should be free; and, regardless of the consequences upon national prosperity, they insist that that freedom must be without restraint.

Their great objection to the Protective system is, that it operates in favor of classes. They overlook the fact that, in their sense of the word, all legislation is class legislation; that, however necessary the protection which Government gives to person or property may be to the country at large, its direct operation is inevitably in favor of classes.

Courts of justice are established and maintained at the public expense for the benefit of those who have law-suits; a class in every community, and happily not a numerous one. The army, during peace, is mostly employed in protecting the class of settlers on the frontiers.—The navigation laws protect the classes of ship owners and ship builders; but this last protection, they say, is necessary to public defence; we must have sailors. What do you want with sailors? To man the navy. What do you want with a navy? Where is the national interest which renders the establishment of a navy necessary? I conceive that England should have a navy for national purposes: she has possessions to protect in all parts of the world, and her rule extends over more than one-half of it. But we are not thus situated. Our Territory is all contiguous, and we scarcely possess half a continent. The United States have no national interest to protect, beyond the range of cannon shot from their shores. Let them fortify the accessible points of the coast, and keep a few steam-frigates at the mouth of their harbors, and they will have accomplished all that the national defence requires. I will probably be told here that commerce must be protected: undoubtedly it must, and for its protection alone the navy is maintained. But the United States are not engaged in commerce in their sovereign capacity; commerce is like sugar-planting, a private pursuit, a class interest. And yet by unanimous consent, not only the ways to the regular markets abroad are lighted and guarded for its benefit, at the public expense and forever, but Government is ready and anxious at all times to incur the expenses attendant upon the opening of new markets in all parts of the world. Not later than last year, how much was spent for that purpose in a mission to China, and a naval armament in the Chinese Seas? And, Sir, if some of the men who took a conspicuous part in sending that mission were told by us, you want new markets, come, we will establish one thousand new sugar plantations in Louisiana and increase the cultivation of those already established; we will create an outlet which will require in the next ten years, in addition to the present consumption of the State, one thousand steam engines, twenty thousand kettles, all from Tennessee; three hundred thousand horses and mules; millions of barrels of provisions, corn and coal, and other things innumerable; it will be the best market during peace, and war will improve it; it will take the produce which other nations won't have; it will not require, as com-

merce does, the perpetual protection of navies, foreign missions and consulates, but it will require for the next ten years a protection not so great in degree, considering the shortness of its duration, but different in kind; it will require that the fiscal regulations of the country remain during that time without any material change. Those men, Sir, would shrink from our proposal, as from a most wicked and damnable heresy. Shall we have to give them up? Will they never consent to carry on the government as it is? Whatever they may say, the question of power is settled as it should be, and when the effect of temporary protection is to secure a permanent national advantage, the right to it is as undeniable as that of merchants to have vessels of war sent to the coast of China; as that of suitors to have courts of justice provided for them.

Free trade is a good thing, Sir, but outlets are good things too. They stand first in the list of our wants, because we must sell before we can purchase. The freedom of trade, like other freedom, has limits beyond which it ceases to be beneficial. It would defeat its object, if it was permitted to interfere with the paramount duty of government, to enlarge by all practicable means, the purchasing power of the productive classes. For the purpose of enlarging that power, new outlets are secured abroad by conquest or by treaty, and those who resort to them are protected by means of embassies, of consulates, of lighthouses, and of naval forces. For the same purpose, outlets are created at home for the existing products, by the introduction of new branches of industry, and these must for a time be protected against foreign competition, by reasonable duties.

The grain and provisions raised upon our soil never can have sufficient outlets abroad; it is, therefore, the business of statesmen to discover the new branches of industry for which the country is prepared, and to convert them by judicious protection into home markets for those superabundant products.

The Western farmers, who every year descend the Mississippi and its tributaries to sell us the surplus of their crops, are on this subject much in advance of our philosophers. They produce a great deal more than they consume, and they have discovered that the cheapest market for them to buy in, is, and ever must be, that which most increases their power to purchase. I bought, not long since, from one of them, one thousand barrels of corn at 72 cents per barrel, and he took in part pay for a year's supply of his family, three hundred pounds of sugar at six cents. He firmly believed that but for the Tariff, he might have obtained the sugar two cents and a half per pound cheaper from Cuba; though when asked how he accounted for the fact that much sugar had been sold here last winter at 2¼ and 2½ cents, he admitted himself to be in, what he termed, a *regular quandary*, but that, he said, was immaterial, for he was aware also, that the Spaniard would not have his corn, and that he could not compel me to grow corn without losing at least one-third of his purchasing power. So that, giving him the full benefit of the absolute free trade doctrines, his account would stand thus: two cents and a half a pound gained on three hundred pounds of sugar; twenty-four cents a barrel lost upon one thousand barrels of corn. That man will never do me harm; he understands our relative position. Let not these be called anti-democratic doctrines; they must be democratic, because they are true. I say that the intelligent protection of new products promotes the general welfare, and admit the expediency of limiting that protection by the necessities of the Treasury; I assert, with Jefferson, that foreign producers have the will and power to prevent the introduction of new branches of industry in our country, and that they must not be permitted to do so. I maintain with Gen. Jackson that a horizontal tariff is not a judicious tariff. Those men and their doctrines are sufficiently democratic for me.

If I were asked what certainty there is that in ten years we will be able to compete with foreign producers, my first answer would be, that after that time we must do so, whether we can or not. Let no act of government check the impulse now given to the cultivation of the cane, and in ten years, more sugar will be made than the United States can consume; when this happens, the surplus will have to meet foreign sugars in the general market of the world; the fiscal regulations will then affect that staple as they now affect cotton and rice, and revenue will have to be raised upon tea and coffee. But, Sir, I do not hesitate to assert that we can be prepared to meet the foreign producers.

There is a strong analogy between the cultivation of the vine in middle France, and that of the cane in Louisiana. During the first centuries of the Christian era, there was no wine produced in France, except Marseilles wine.—More Southern Europe and the Isles of Greece were then the wine-growing regions. In the course of time, the monks of Aquitaine, of Champaign, and of Burgundy, God bless them! transplanted the vine to the shelter of their convent walls. Their efforts were for a long time unsuccessful, but they persevered, and the great saints of those dark ages took a conspicuous part in the good work. At last their grapes attained maturity; they tasted the juice, and said it was good. Wine was subsequently made of it, and it is easy to conceive the joy of those holy men, when Champaign first sparkled on their board, when the vintages of Medoc and Burgundy replaced in their cellars the rough beverages of Provence. The cultivation of the vine continued to increase and to improve, but the increase was so slow that wine was not exported from Bordeaux to foreign countries, till some time in the twelfth century. And now, Sir, the great wine region of the world is that very portion of France, in which the introduction of the vine was the work of centuries.

How is it with the sugar cane in Louisiana? It was introduced here at an early day from the West Indies, and cultivated to a small extent at at Terre aux Bœufs, and in the neighborhood of New-Orleans. Nobody at first imagined that sugar could be made of it. The juice was boiled into syrup, which sold at extravagant prices. In 1796 Mr. Bore, residing a few miles above New-Orleans, a man reputed for his daring and his energy, formed the desperate resolve of making sugar. He increased his cultivation, put up the necessary buildings and machinery, and procured a sugar-maker from the West Indies.—The day appointed for the experiment was come, and the operation was under way. The inhabitants of New-Orleans and of the coast had assembled there in great numbers. But they remained outside of the building at a respectable distance from the sugar-maker, whom they looked upon as a sort of magician. The

first *strike* came, and he said nothing; this they thought fatal, but still they remained fixed to the spot. The second strike was out; the sugar-maker carefully stirred the first, and then advancing toward the assembled crowd, told them with all the gravity of his craft, "Gentlemen, it grains!" "It grains!" was repeated by all.—They rushed in to see the wonder, and when convinced of the fact, scattered in all directions, greeting every body they met, with "It grains!" And from the Balize to the Dubuque, from the Wabash to the Yellow Stone, the great, the all-absorbing news of the colony was, that the juice of the cane had grained in Lower Louisiana. It did grain, it has continued to grain; it has grained the last season, at the rate of two hundred and fifteen millions of pounds, and if no untoward action of government prevents it, in ten years it will grain to the extent of much more than double that quantity. Prepare therefore to meet foreign competition. I tell you we can do so, as well as the wine growers of France, provided we improve the time that is left us, and remain true to the spirit of our national race.

The innate faculty of our people to subdue the physical world, their energy and self-reliance, their habitual disregard of discomfort, difficulties and dangers, have made other nations say of us, that we alone could instil heroism in the common pursuits of life. With heroic determination then, speed the plow; bear in mind that to go ahead without ever taking difficulties into the account, and by that means to succeed when others dare not undertake, is emphatically the AMERICAN SYSTEM.

Manufacture of Manure.—I think I may affirm, from what I frequently witness in the mode of making and managing manure, that many do not sufficiently consider the great difference between strong and weak manure, in its fructifying quality, and durable effects in invigorating the land to which it is applied; and this is an important thing for every farmer to well understand. If straw and hay only, without cake or corn, compose the manure that is taken to the land, (and many, to my knowledge, even of those who could well afford to buy them, continue this bad practice,) comparatively it is as sour small beer to a man who has an extraordinary task of labor to perform, and needs the aid of a powerful stimulant to enable him to accomplish it. As the man would fall short under such treatment, so does the land fail in like manner. Now if I can show that the corn given to stock upon a farm, is all returned in extra produce, besides manifold advantages, which your sagacious readers will readily discover, surely all that have the means of entering upon this system will do so. I will take my own business for an example. I shall this winter use 100 quarters of corn upon my stock, exclusive of horses. I calculate the manure I shall make with which this corn is incorporated, will manure well 36 acres, and as my system of farming is three crops and a fallow, three crops will be gathered before the same land will be manured again. I will ask any practical farmer, may I not reasonably calculate upon a quarter of corn per acre more upon each of the three crops, than I might have expected had I put on the same land the same quantity of manure of the weak kind, made from hay and straw alone? Assuming, then, that I get one quarter of corn more in each of the three crops by using the corn, the 36 acres in the three years return 108 quarters extra produce for the 100 expended. Of course it will be obvious to every practical man, that rich manures should not lie in the yard, exposed to the washing of heavy rains, but made principally under cover, and frequently collected into a heap, and well secured until taken to the land, and especial care taken that the fermentation does not become too rapid; to prevent which anything may be mixed when it is put together that is likely to check and cool it. I use sand when I cannot obtain anything better for that purpose, and to cover the heap over to prevent it being weakened by evaporation. A farmer does not require a philosopher or a chemist to inform him wherein the strength of manure consists; he has only to refer to his cattle-stalls, his pig-sty, and dove-cote; it is there seen that the manure that contains the most corn in proportion to other matter composing it, is invariably found to be the strongest and best. [A Farmer, in Bell's Weekly Messenger.

The following facts are worth the consideration of the Members of Clubs:

Destruction of Sparrows and other Birds.—Mr. Bradley, in his general treatise on Husbandry and Gardening, shows that a pair of sparrows during the time they have their young to feed, destroy on an average every week 3,360 caterpillars. The calculation he founded on actual observation, having remarked that the two parents carried to the nest forty caterpillars, &c., &c., in an hour. These birds likewise feed their young with butterflies, and other winged insects, each of which, if not destroyed in this manner, would be the parent of hundreds of caterpillars.—[A correspondent of ours, who has paid much attention to the rearing of butterflies, &c., in order to obtain perfect specimens for an entomological cabinet, had 840 caterpillars hatched from the eggs laid by one female, of this tribe of insects, in the course of a few days.]—A gentleman writing on the use of birds, in the "Horticultural Register," states that the gold-crested wren, willow-wren, or hay-birds, and chiff-chaff, eat insects only. Where they are plentiful, they may be of great use in thinning, on their first appearance, wheat-flies, blue dolphins, hop-flies, and the pea-plant aphides.—This is important, for one of these insects killed on their first appearance will prevent the breeding of thousands. Gardeners are prejudiced against the hay-bird, or cherry-chopper, but it does not taste either cherries or strawberries, but the cherry plant louse, which ravages cherry leaves in April. Nightingales eat insects only; so do the win-chat, the stone-chat, wheat-ear, pippits, and wag-tails. Every means should, therefore, be taken to encourage them to breed, by protecting their nests. The principal insect-eating birds, which partially eat fruits or seeds, are the common wren, house and hedge-sparrows, red-breast, chaffinch, black-cap, garden-warbler, and the greater and lesser white-throats, also the tom-tits. The march-tits eat insects chiefly, but also eat farinaceous seeds, as those of the sun-flower, or peck a bit of ripe pear or apple; but such damage is trifling, and is a reward which should not be grudged, considering the great good which they do both to the farmer and gardener.

COMPARISON OF GUANO WITH OTHER MANURES.

BY DAVID BARCLAY, M. P.

To W. Miles, Esq. M. P.

My Dear Sir: The very extensive use of Guano as a manure, and the prospect of very large supplies from Peru and the West Coast of Africa, induced you to recommend to the Council of our Society that some of its members should undertake to test the relative value of the different kinds, including Potter's artificial Guano, as compared with farm-yard manure; and Humphrey's compound was subsequently proposed to be tried at the same time. I undertook, for one, to make these experiments. We were instructed to sow Skirving's Swede, and to apply 20 tons of farm-yard dung to the acre, 3 cwt. of Guano, and such quantities of Potter's Guano and Humphrey's compound as the proprietors might desire.

The land which I selected for making these experiments is a light, flinty loam, of uniform quality, with a chalk subsoil. Long strips of an acre each were measured with exactness, and admitted of 16 rows of plants in each strip, at the distance of 26 inches between the ridges. Four acres were drilled on the 22d of June; the fifth acre, with Humphrey's compound, was delayed for want of seed till the 26th. Instead, however, of 20 tons of dung, as proposed, only 12 tons were applied; of the African and Peruvian Guano, and of Humphrey's compound, 3 cwt. each; and of Potter's artificial Guano 4 cwt. by his desire: all were mixed with 9 cwt. of ashes, and drilled in with the seed on the Scotch system. The 5 acres were twice hoed. About the middle of January, 1845, 2 entire rows out of the 16 in each strip were raised, trimmed, and weighed, and the weights, multiplied by 8, must have given the weight per acre with accuracy, as, owing to the great length of the rows, no material departure from exact results could take place. The following table will show the cost of each manure, the produce per acre, the value estimated at 15s. per ton, also the cost of each manure, and its application per ton of roots.

The long drought which we experienced will account for the small produce per acre, and may possibly have exercised a greater influence on one description of manure than on another; I cannot, therefore, consider my experiments so decisive of the relative value of the manures as if the season had been more propitious: but should the trials undertaken by others correspond in their results with mine, information will be elicited which may be useful to the agricultural body. It was remarked that the drought appeared to have the most influence on the acre manured with dung, turning the leaves more yellow than on the other strips dressed with Guano; and until the weights convinced us of our mistake, we were under a strong impression that the guanos had beaten the dung. There remains for us to learn the value of these manures upon the succeeding crop of barley, for which purpose the 5 acres will be carefully distinguished, and the produce of each accurately measured.

I remain, sir, yours, &c. &c.,
DAVID BARCLAY.

Eastwick, February 12, 1845.

Account of Experiments *as to the relative Value of Farm-yard Manure, African Guano, Peruvian Guano, Potter's Guano, and Humphrey's Farmers' Compound, conducted on Eastwick Farm, in the County of Surrey.*

No.	Description of Manure.	Quantity used per Imperial Acre.	Cost of Manure, Carriage, and Application.	£ s. d.	Produce of trimmed Swedes per Acre. T. cwt. qr. lb.	Value of Produce at 15s. per Ton. £ s. d.	Cost of Manure and Application per Ton of Swedes. s. d.
1	Farm-yard..	12 Tons.....	At 5s.	3 0 0	9 7 3 20	7 1 0	9 4
			Carriage, ...	1 4 0			
			Spreading,...	0 4 0			
				4 8 0			
2	African Guano...	3 Cwt..	At 6*l.* 10*s.* per ton,..	0 19 6	8 2 0 0	6 1 6	2 8½
			Sowing,....	0 2 0			
				1 1 6			
3	Peruvian Guano..	3 Cwt..	At 10*l.* 10*s.*...	1 11 6	8 0 0 0	6 0 0	4 2½
			Sowing, ...	0 2 0			
				1 13 6			
4	Potter's Guano...	4 Cwt..	At 12*l.*.....	2 8 0	8 17 2 8	6 13 2	5 7¼
			Sowing, ...	0 2 0			
				2 10 0			
5	Humphrey's Farmers' Compound.....	3 Cwt.	At 12*l.*, ...	1 16 0	5 17 3 0	4 8 3¾	6 6
			Sowing, ...	0 2 0			
				1 18 0			

On the Mismanagement of Stable-Dung Manure, especially as regards Exposure to Rain.—Whilst, at a vast expense, the farmer is importing bones from the shores of the Black Sea, nitrate of soda from South America, guano from the coast of Peru and from the African coast, he is, in too many instances, negligent of the manure that his stable and stalls supply. This negligence has been pointed out, and emphatically dwelt on, by every recent writer of authority on Agriculture. As regards exposure to rain, and the injurious effects of it on the kind of manure just alluded to, examples of it, in this part of England (Westmoreland), where an unusual quantity of rain falls, are of every-day occurrence, and almost every where to be met with: the instances of neglect constitute the rule; of care and attention, the rare exception to the rule. The farm-steadings here are commonly on declivities; the dung-heap is usually placed on a declivity, often by the side of a road, and, in consequence, after every shower of rain, the water that runs off, percolating through the manure, robs it of some of its most valuable ingredients, especially its soluble salts, and soluble animal and vegetable matter, tending to starve the fields and pollute the roads. I have had the curiosity to collect portions of such drainage, and subject them to examination; and I now propose to give the results, as they show, in a very marked manner, the injurious effect, and how great is the loss to the farmer in consequence. The first portion collected was from a heap of stable-dung, fresh from the stable just before a heavy fall of rain, the accompaniment of a thunder-storm, nearly an inch falling in three hours. The water which ran from the dung-heap was of the color of a weak infusion of coffee, of sp. gr. 1002, to pure water as 1000. With the peculiar smell of stable-dung, it had a just perceptible smell of ammonia, which was rendered more distinct by the addition of lime. Under the microscope, it was found to contain, besides a fine granular matter, and many minute vegetable fibres and scales, particles resembling grains of pollen, and two or three different kinds of animalcules. Evaporated to dryness, it yielded 2·6 per 1000 of brown matter, which partially deliquesced on exposure to a moist atmosphere; emitted a very faint smell of ammonia when mixed with lime, indicating that in the process of evaporation, most of the ammoniacal salt had been expelled, and was therefore carbonate of ammonia; and when incinerated afforded as much as 51·6 per cent of grey ash—48·4 per cent. of the extract having been destroyed by the fire, which may be considered as animal and vegetable matter. The ash was found to contain the sulphuric, phosphoric, and carbonic acids, and chlorine, with potash, soda, lime, and magnesia, chiefly in the form, it may be inferred, of carbonate of potash, phosphate of lime, sulphate of lime, sulphate of magnesia, and common salt. The proportional quantity of the sulphate of lime was large, as was also that of the fixed alkaline salts, whilst that of the phosphate of lime and the magnesian salt was small. The next specimen examined was from a much larger and older dung-heap, after a fall of 1·12 inch of rain in about 12 hours. The fluid was of a darker brown than the preceding, very similar in its appearance under the microscope, of higher sp. gr., viz: 1008, and yet less rich in ammoniacal salts, for when mixed with lime, it gave only a very faint smell of ammonia; and its extract obtained by evaporation, when mixed with lime, had no smell of the volatile alkali. It yielded, on evaporation, 10·4 per 1000 solid matter, similar generally to that obtained from the first portion in its qualities, abounding, in like manner, in salts, and those of the same description. The third specimen collected for examination was from the same dung-heap, after a fall of 2·79 inches of rain, in 24 hours. It differed so little from the preceding, that it is not necessary to describe it particularly. As might have been expected, it was more dilute, its sp. gr. being 1004. The last specimen I shall notice was one procured from the same dung-heap, after four days of dry weather following the heavy rain last mentioned. It was oozing out slowly in small quantity; was of a dark brown hue, nearly transparent, and almost destitute of smell. Under the microscope it exhibited a few particles and fibres, a very few minute crystals, without any animalcules. I had expected to have found it a concentrated infusion of the dung-heap, and, as such, of high specific gravity; but it was otherwise; its specific gravity exceeded very little that of the preceding, and was less than that of the second portion, being only 1005, leading to the conclusion that the manure was nearly exhausted of its soluble matter. The weather, during the four days without rain, was comparatively cold for the season (it was in September), with a northerly wind—the thermometer, even by day, below 58°, and at night once or twice approaching the freezing point. This low temperature must have checked or put a stop to fermentation, which, in its turn, might have prevented the further formation of soluble matter. The infusion mixed with lime indicated the presence of ammoniacal salts; it emitted a pretty strong smell of ammonia; and, judging from the effects of other reagents, its composition was very similar to that of the preceding portions; it probably contained a larger proportion of vegetable matter, humus and humic acid, than the earlier drainings; it gave a very copious precipitate with the acetate of lead. The bearing and application of these results hardly require to be pointed out. As the drainage of the dung-heap exposed to rain contains some of the best—the chief ingredients of active manure, (excepting always the insoluble phosphates,) it follows, that the more the dung is exposed—the more it is subjected to the washing and percolation of rain-water—the greater must be its loss, the poorer and more exhausted it must become; and that shelter from rain is essential as a prevention; such a shelter as can only be well secured by a shed, under which the manure, if too dry, may be watered with the liquid that may have run from it, received into a tank; and be subjected to such treatment, from admixture or otherwise, as has been found by experience likely to render it more efficient. These results, moreover, I need hardly remark, are perfectly in accordance with the experience of intelligent farmers, in many instances on record, of the extraordinary fertilizing effects of irrigation with waters—the washings and drainage of the farm-yard and dung-heap.

[John Davy, M. D. in the Edin. Phil. Journal.—The Oaks, Ambleside, Oct. 12, 1844.

Manure for Onions.—For the information of "J. C. C.," of Exeter (p. 225), I beg to say that last year I had one of the finest crops of Onions I ever saw; they were cultivated as fol-

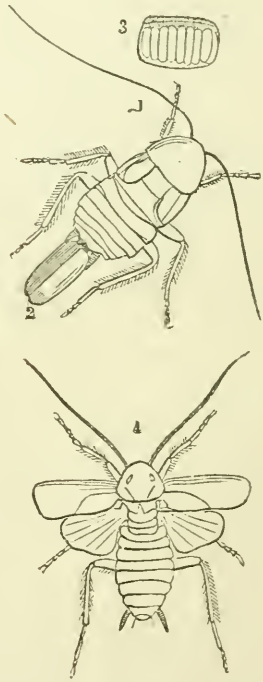
lows:—The ground (which is a stiff loam on the lower oolite), was ridged up before winter. In the middle of March the ridges were levelled, and about 3 inches in thickness of compost was spread and pointed in so shallow as to be only barely covered with earth. The seed was immediately afterwards sown in drills 9 inches apart, and between every five rows was an alley 18 inches in width. Waterings were frequently applied during the early growth of the crop; and it was twice watered with water in which guano was dissolved. The compost consisted of about one-third well-rotted old hot-bed dung, one-third old night-soil, and the remainder of wood-ashes, and black woollen manure from a clothing factory in equal quantities; the latter contained a considerable quantity of oil. The whole had been well mixed together some months before it was applied. [Cultor.

From the London Gardeners' Chron. June 21, 1845.

ENTOMOLOGY.—*The Cockroach, or Black-Beetle (Blatta orientalis).*—This too well-known insect sometimes overruns dwelling-houses, warehouses, mills, and bakehouses, and even ships at sea, to an extent which renders them almost untenable. The same species which infests our habitations is also a complete pest in Russia and Finland, and has made its way thence into Sweden. The Cockroaches are very active creatures, and being nocturnal, exceedingly voracious, omnivorous, and endowed with a surprising fecundity, they become a great annoyance where they take up their quarters. When in excess, their scent is very sickly and disagreeable, and besides defiling whatever they touch in the kitchen or larder, they will nibble the leather of boots and shoes, the binding of books, and even wearing apparel, especially if they be old and dirty. The casks of biscuits and cheese on board ships, are greatly injured by the inroads of these vermin; this, however, is frequently the work of another species, the B. Americana, which is fortunately confined at present to the storehouses along the banks of the Thames; and a smaller species named B. lapponica* is equally destructive.—Even man is not secure in his person from their assaults, for in the West Indies the larger species have been known to eat the toes and fingers to the quick during the period of sleep, and after death they will prey upon the human body like vultures, as may be seen when the charnel-houses at Naples are opened for the daily reception of the dead!

It is undeniable that Cockroaches delight in warmth, preferring kitchen grates, bakers' offices, mills, &c., and we never meet with them during the Winter or cold months of Spring, and although it is impossible to ascertain from what country the B. orientalis was first imported, it no doubt has been migrating from a hotter climate than our own; in all probability it came from the East, and such seems to have been the opinion of Linnæus, from the name he assigned to it. Cockroaches also detest the light, and for that reason we seldom see them in the day time, and as soon as a candle is introduced into a dark kitchen, they scamper off into holes and crevices to hide themselves.

The males have wings, of which the females are destitute; indeed they do not require them, as their province is to rear their young: their bodies, moreover, are often so large and heavy that they would stand in need of much more ample organs of flight than their male companions, which cannot often use them, for I never saw one flying. The females are frequently seen moving about with a large oval mass of eggs, as represented at fig. 1, it is said sometimes for a week, until they can find a convenient spot to deposit them: this leathery case (fig. 2) is of a pitchy color, with a sharp serrated ridge along the back, consisting of 16 points, and on dividing one of these bags longitudinally, it will be found to contain about the same number of elliptical cells (fig. 3); each of these produces a young Cockroach, which is able to run about as soon as it issues from the egg through the serrated suture, which splits for that purpose, and from that time to its death it is feeding, growing, and passing through its different stages of larva, pupa, and imago, with very little change of aspect compared with most of the other orders of insects.



Blatta orientalis is of a deep shining chestnut brown; the orbicular head is bent down and concealed beneath the thoracic shield; the mouth is furnished with an upper and under lip, two strong-toothed jaws, and four feelers*; the eyes are kidney shaped, and excessively finely reticulated, and close to the inner margin is an ochreous membranous spot; the antennæ are like two pubescent bristles, as long as the animal, composed of numerous joints, and inserted in little cavities close to the inner margin of the eyes; the thorax forms a large shield, somewhat triangular, with the angles rounded; in the males

* Curtis's Brit. Ent., fol. & pl. 556.

* Curtis's Brit. Ent., fol. & pl. 256.

(fig. 4) there is an incurved indentation on each side of the disc with a ferruginous line down the center; the scutellum is broad and undefined; the elytra sometimes extend almost to the apex of the abdomen; they are coriaceous, elliptical, and rough, with numerous nervures, the inner edge of one lying over the other in repose, beneath these are folded the wings, which are often shorter, membraneous, with numerous branching nervures, and reticulated; the abdomen is depressed, elongate-ovate, and composed of eight segments; from the base of the last arise on each side two spear-shaped processes, formed of short joints, and to the under side of the same are attached two slender curved appendages; the six legs are strong and longish, the coxæ and thighs are stout; the tibiæ are spiny; the tarsi are more slender and five-jointed, the basal joint being long, the fourth minute, and the fifth terminated by two curved sharp claws. The female (fig. 1) is generally larger, and the thorax smoother; instead of wings there is only a rudimentary elytron on each, with two broad thoracic segments between them; the abdomen is more elliptical before the egg-bag is excluded, and although it has the jointed appendages at the apex, the two little thread-like ones are wanting, and this at once distinguishes the sexes.

The female is very similar to the pupa, and indeed it seems to remain in that state, except that it has the little elytra, which are altogether wanting, I believe, in the pupæ. I may state that the egg-bags often have a hole on one side from which a parasitic fly had issued, called Evania, which possibly we may treat of hereafter.

Of all the remedies, a hedgehog, I know, from my own observations, is the most efficacious, and wool or tow dipped in spirits of turpentine and thrust into their habitations, will kill and expel them, but this unfortunately is attended with danger; sprinkling over by day the spots they frequent would be safer, and probably attended with equal success if persevered in.

[Ruricola.

CHESHIRE CHEESE.

Reflecting on the increase of our export of Cheese to England, and how favorably the best American is said already to compare with the best English article, it might be deemed unreasonable to occupy so much space as is given in this number to the Essay on the making of Cheshire Cheese—inasmuch as it may be supposed that American cheese-makers have little to learn on the subject. But in the first place, we have to consider that the Agricultural Society of the Country where this matter is practically as well, if not better, understood than in any other in the world, has indicated its belief that there was yet room for observation and improvement, by offering a premium for the best Essay; and then, it is not to be forgotten, that according to the fixed rules of competition for all the prizes of that Society, all information contained in prize Essays, must be founded on *experience or observation*, and not on simple reference to books or other sources.—Furthermore, the Society is not bound to award the prize at all, if the Essay, though the best offered, may not in itself be deemed worthy of it. Thus we have a strong guaranty as well for the need, as for the merit, of the Essay in this case.

Is it not a little remarkable, that the knowledge and the habit of cheese-making should have been confined, almost without variation, since the first settlement of the country, as far as we are advised, to a particular part of the United States; and that in adjoining States the people should remain in total ignorance of the process from beginning to end—ignorance so total and profound, that we apprehend some young men, who ought to be familiar at least with the theory of all such subjects, will here for the first time read, in a way to have impressed on their memories, *even the exact meaning of the word rennet?*

In all the State of Maryland, within the recollection of the writer, there has been, time out of mind, but *one cheese-maker*—and but one *raiser* or cultivator of *pea-nuts*, or ground peas. These men were as remarkable in their day and generation as Izaak Walton among fishermen in times past, and Mr. Wilder of Boston among gentlemen-fruiterers and florists at the present day. Both those characters, so distinguished, each in his line, have gone the way of all flesh, which Scripture saith is but "grass," and with them have passed, into utter desuetude, their respective occupations. One was Mr. Sproston, a respected farmer of Cecil county, Maryland, who, in possessing the mystery of cheese-making, was regarded with a degree of superstitious respect, as a sort of necromancer. The other character was an old gray-headed, gray-bearded *African born negro*, who, by some chance, tradition saith not how, got, solitary and alone of his race, into Calvert county. To him was yielded

implicitly the monopoly of pea-nut—or *"peander"* making, as it was vulgarly called. If any one knew his process they dared not imitate it —"Old Mawney," as he was called and known throughout the county, could barely contrive to make himself understood in a sort of broken English—which being engrafted on the African tongue rather late in life, never grew well.—Mawney's great staple and support through life was his *pea-nut crop,* with which he traveled usually on Saturdays round the county, carrying his bag on his back and selling its precious contents by the quart. Every boy of that ilk lived in awful respect of "Old Mawney," the more because "he came from Guinea," and would have as soon entered the cave of Polyphemus as to have approached Mawney's hut alone—with them, like Bethlehem Gabor, the misanthrope in the novel, he carried about him an atmosphere of mysterious potency for evil beyond which no urchin ever dared to penetrate. Gentle reader; excuse this episode into which school-boy recollections have drawn us. Who that has a heart in his bosom is not liable to be sometimes seized and run away with by such associations—who so stedfast that is not sometimes carried back in imagination so vividly as to believe himself with some chosen school-companion mounting his rod and knotting his line, or watching to bring down the merry squirrel from the hickory-nut tree, or tracking the poor rabbit to his form in the snow? Who would not join again and forever remain among his school-companions?

"Gay hope was theirs, by fancy fed,
Less pleasing when possessed;
The tear forgot, as soon as shed,
The sunshine of the breast."

Well, we dare say some readers would as soon have us proceed with the *ode* as with the *essay.* What we have said has been to show how it is that we suppose all the world may not know quite all about cheese-making; and now *revenons a nos moutons.*

We have already shown, from Hunt's Merchants' Magazine, how the export of American Cheese to England had increased from 14,000 pounds in 1842, to 53,000 in 1844, and there is reason to believe that the export of 1845 will go up to 100,000, and that without any alteration in the British tariff to encourage it. But who does not know that the avenue to profit must be utterly inaccessible that is not penetrated by Yankee enterprise? See Willis' letter, in which he speaks of Wenham, Massachusetts, *ice* being hawked about the streets of London in carts nicely painted and labeled "WENHAM ICE."—How, but by such extraordinary sagacity and industry, could such a population be kept out of debt and thriving, with a soil so rocky and a climate so cold?

The dairy produce is consolidated in the last census under that one head, no distinction being made between butter and cheese any more than between horses and mules. The whole amount is set down at the value of $33,787,008. Of this amount much more than two-thirds is produced East of the Chesapeake, including Pennsylvania.

This branch of British agricultural industry is protected by a duty of 10*s.* 6*d.* (say $2 62½) per hundred on all Cheese imported from foreign countries, and 2*s.* 6*d.* (or 62½ cents) on that which is imported from British possessions. We dare not take room here to go into the remarks which the subject invites, on the influence which herbage and the treatment of the cows exercise on the products of the dairy, but let the reader have patience, all in good time for that, and for practical dissertations on Chilton, Parmesan and other kinds of Cheese. The best Essay on the making of the latter, from A. to Z. is from the pen of Mr. Jefferson, being notes made by him in a dairy in Parma, where he attended closely, and took notes from morning to night, *while he was Minister of the U. S. to France.*

A DETAILED ACCOUNT OF THE MAKING OF CHESHIRE CHEESE. By HENRY WHITE, Land Agent and Surveyor, Warrington....Prize Essay.

IT has sometimes been a matter of dispute amongst Englishmen which particular county or district is the most famous for the making of cheese. I think, if quantity is to be taken into account as well as quality, the decision must be in favor of Cheshire, as there cannot be less, upon a moderate calculation, than 12,000 tons made in that county annually; a considerable portion of which is of excellent quality.

There is reason for believing that cheese has been made in Cheshire for at least 700 years:* and, from allusions made to cheese and to curd in the Old Testament,† it is evident that an article of this nature must have been known and used at a very early period.

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* "The fame of the cheeses of Cheshire is of very ancient date: at least as old as the reign of Henry I. (A. D. 1100). The Countess Constance of Chester, though the wife of Hugh Lupus, the king's first cousin, kept a herd of kine, and made good cheeses, three of which she presented to the Archbishop of Canterbury. Giraldus Cambrensis bears honorable testimony to the excellence of the Cheshire cheeses of the day." *(Bell's Weekly Messenger, Feb.* 22, 1841.) "Poor men eat cheese for hunger, rich for digestion. It seems that the ancient British had no skill in the making thereof, till taught by the Romans, and now the Romans may even learn of us more exactness therein. The county of Chester doth afford the best for quantity and quality; and yet their cows are not (as in other shires) housed in the winter; so that it may seem strange, that the hardiest kine should yield the tenderest cheese. Some essayed in vain to make the like in other places, though hence they fetched both their kine and dairy-maids. It seems they should have fetched their ground too (wherein surely some occult excellency in this kind), or else so good cheese will not be made. I hear not the like commendation of the butter in this county; and perchance these two commodities are like stars of a different horizon, so that the elevation of the one to eminency is the depression of the other."
[Fuller's Worthies.

† 1 Sam. xvii. 18; 2 Sam. xvii. 29; Job x. 10.

It is scarcely necessary to premise that milk, from which cheese is made, consists of three distinct parts—*cream, curd,* and *whey*—into which, by repose, it spontaneously separates; but the process of separating the whey from the other bodies may, as in cheese-making, be accelerated by infusing a small quantity of a simple acid extracted from cured and dried maw-skins,* which have been previously dissolved in warm water. This infusion is commonly called "steep," but more properly *rennet.*

The art of cheese-making consists in the complete extraction of the whey and in the proper compacting and curing of the curd. The richness of the cheese depends upon the quality of the milk, or, in other words, on the proportion of cream which the milk contains. The cheese of Cheshire is professedly made from new milk, or milk from which no cream has been taken.—It is, however, well known, that in many dairies, in the morning before cheese making, a small quantity of cream is skimmed off the previous evening's milk; this cream is either churned by itself, or mixed with whey-cream, by which there is obtained a better quality and greater quantity of (so-called) whey-butter. It may appear singular to some, that any portion of cream should be found in whey, but such is the fact, and the means used in Cheshire for extracting it are very simple *(See Appendix.)*

Before entering into a detailed description of the mode employed in Cheshire in the making of cheese, I would remark that this Essay is founded upon my own observations, made during a fifteen years' residence in, and intimate connexion with, that county; which latter is still existing. I have long felt an interest in the subject of cheese-making, with a desire to see it conducted upon more scientific principles, from a conviction that, were such the case, both the pocket of the producer and the stomach of the consumer would often be more agreeably filled: but I do not wish it to be supposed from this remark that I profess myself conversant with these principles: my information being more of a practical nature, and as such I offer it to the Society.

Number of Cows kept, and Produce.—The number of cows kept for the purposes of a cheese *dairy* is seldom less than 8 or 10, or more than 70 or 80; and is of course regulated by the size of the farms—these average about 90 or 160 statute acres, upon each of which about 15 or 18 cows are kept. From 18 cows, a cheese of from 36 lbs. to 54 lbs. weight is made daily during four or five months of the summer.† The annual produce of cheese per cow depends both upon the quality of the animal (with the mode of keeping her) and of the *land,* or rather the *herbage.* I have known many farmers sustain great loss by not feeding their cattle sufficiently well in winter. With judicious management, about 3 cwt. of cheese (of 112 lbs.) may be considered as the average amount made per annum upon land let for 30s. [$7 50 annual rent] a statute acre; but in a few instances 5 cwt. per cow, and even more, is sometimes made. This can only be from a small and choice stock.

The Season.—It is the practice amongst farmers in this county to arrange so as to have most of their cows calving in the months of March and April; and so soon as the calves are fed or disposed of, the cheese-making commences, and continues (excepting in small dairies) to nearly the end of the year. In January and February the quantity of milk obtained is often so small that the farmer prefers selling it in the neighboring towns or making it into butter. There are, however, instances, in large dairies (of 70 or 80 cows), of cheese being made throughout the year.

Milking.—The operation commences about five o'clock in the morning, and five or six in the evening. In this county it is the practice for most of the servants, both men and maids, to assist, and for the cows to be milked in the cow-houses (called here "shippons") all the year round. When, as is usual, there is one milker for every six or seven cows, the milking seldom exceeds an hour and a quarter.*

The milk of new-calved cows is not mixed with the other until about four or five days after calving.

Offices and Utensils.—As the evening's milk is seldom made into cheese until the following morning, and sometimes in small dairies (where four "meals" are used) not until the second morning, a cool "milk-house" is necessary; on which account it usually occupies that side of the farm-house least exposed to the sun. The utensils in which the milk is kept are usually portable shallow earthenware vessels called "pan-mugs," and in some dairies leaden or zinc coolers. Most of the milk-rooms have lattice or wire windows for the circulation of air, and the floors are laid in a sloping form for the free escape of the cold water with which they are daily swilled throughout the summer months. If precautions of this nature be not attended to, there is a risk of the evening's milk becoming *sour;* in which case, whatever quantity of new milk be added to it in the morning, the cheese will be *sour* also. I am led to believe that a temperature of as near 50° Fahrenheit as could be maintained, would be best for a milk-house throughout the year.—The *dairy* is generally situate near the milk-house, and fitted up with two *set-pans* or *boilers*† —a large one for scalding the whey, and a smaller one for heating water. The "cheese-presses" and "screw" are kept within this room, and the operation of cheese-making is here carried on. Some farm-houses are not provided with a *dairy,* and the cheese is then made in the *kitchen*—this is commonly the case on small farms. The "salting and drying-house" (often one and the same room), if conveniently situated, adjoins the dairy. The cheese is placed here on stone or wooden benches, salted *externally,* and is afterwards left so as to dry gradually before being removed to the cheese-room. By some dairy-maids, this external salting is dispensed with, and the room is then of

* The *stomachs of sucking calves.* See the method of curing these in the Appendix.

† The Marquess of Cholmondeley and Mr. Tollemache, M. P., with a laudable desire to encourage the suspension of Sunday labor, have, for several years, offered through the South Cheshire Agricultural Society a prize of £20 to such farmer as shall have made the best cheese without infringing on the Sabbath rest. Although this prize has, I believe, been regularly claimed, yet, from a variety of causes, the practice of making cheese on the Sabbath, as on other days, is still very general.

* I was told by an apparently very respectable man, at Saratoga Springs last week, that he knew a New-York farmer, worth more than $200,000, whose daughters milked the cows regularly. [*Ed. F. L.*

† South of New-Jersey, milk-house and dairy are synonymous. [*Ed. F. L.*

course only used for *drying*. These offices are all on the ground-floor. In some cases the cheese-room is over the dairy, in others over the kitchen, or some other room wherein a fire is usually kept, and sometimes, though rarely, over the *cow-houses* or *stables*. Light and air are invariably excluded, either by a curtain or shutters.* The floor is either of plaster (gypsum) or boards, but more commonly the latter; some of the larger cheese-rooms are warmed by stoves, or hot air, and occasionally, though rarely, by fire-places in the room itself. The small cheese-rooms are seldom supplied with artificial heat, except what is gained from the rooms below.—Some cheese-rooms are occasionally found to be in the summer time too warm, in which case the cheese has to be removed for a time to a cooler part of the house. This is more generally necessary where the building is slated, and exposed to the noon-day sun; but is seldom or never experienced where the roof is of thatch. The size of these offices is of course regulated by the extent of the farm; where 30 cows are kept I find them nearly as follows:

	Yds.	Yds.		Sq.Yds.
Milk-house	6 by	3	or about	18
Dairy	6 by	5	"	30
Salting and drying-house	4 by	5	"	20
Cheese-room over dairy and drying-house	10 by	5 (or 8 by 6)	"	50

The utensils, excepting those I have described, will be noticed hereafter.

Process of Cheese-making.—As the first process—namely, that of extracting the whey and salting—occupies, according to circumstances, from five to seven hours, it is found most convenient to commence it in the morning. This being the case, the evening's milk has to be kept all night in the milk-house. In the morning, the cream having been skimmed off, a portion of this milk is warmed. This is done in a circular flat-bottomed brass or tin pan, (see *a*, fig. 4,) floated in the boiler, the water of which has been previously heated for that purpose: the size of this pan is about 20 inches in diameter and 8 inches deep. The quantity to be warmed depends upon the state of the weather; for the first two or three months of the season (say March, April and May) it is not unusual to heat as much as half the evening's milk to a temperature of 100° Fahrenheit, and this heat is rarely exceeded, excepting by those dairymaids who wish to save themselves trouble in the after process. The "cheese-tub," which is similar to a brewing-tub, having been placed in readiness in the dairy, the cold milk is now put in and the warm added. Supposing the temperature of the cold milk to be about 50°, and the warm 100°, and they were in equal proportions, the heat after mixing would be 75°, or something less; but in warm weather it will be sufficient if it reaches 70°. I have known instances of good cheese being made in summer without warming any portion of the evening's milk—indeed, such now is becoming the general practice. In very warm weather some dairy-maids think it necessary to reduce even the temperature of the morning's milk. The *cream*, which is diluted either in about double its quantity of warm or new milk, or by being exposed to the heat of the boiler in the same way as the milk, is next put in. I have before stated that it is customary to retain a small part of the cream for butter: when this is the case, it is considered best to skim it off the whole surface of the cream before diluting, as by that means the froth and bubbles, which are supposed to be prejudicial to the cheese, will, for the most part, be taken off. This leads me to the conclusion that *fixed air*, if it gets mixed in the curd, has been found to be detrimental. Since warming of fluids has a tendency to dispel this fixed air, it is perhaps worthy of consideration whether it would not be better to warm the *whole* of the evening's milk to the required temperature, rather than heating a *part* of it so high as 100°. The process adopted with the evening's milk, as above described, is generally finished previous to the time of milking in the morning; but if not, the dairymaid stops and completes it before the *new* milk is brought in from the cows. This new or morning's milk is then added by passing it through a *sieve* placed upon the "cheese-ladder" over the cheese-tub. When the whole is thus collected, some few bubbles are invariably found floating on the surface; these are skimmed off and passed through the sieve to break them.

One of the most important points now to be attended to is the heat of the milk preparatory to coagulation, as the milk, if at a proper temperature, should now be ready to "set together," that is, to receive the rennet. This heat is rarely tested by any other thermometer than that of the dairymaid's hand; some may, and I have no doubt do, determine it pretty correctly, but cannot always.

In consequence of the changes in the weather it is difficult even for an experienced dairymaid to know at all times what proportion of the evening's milk should be warmed; she is therefore cautious not to warm too much, until the morning's milk is added and the consequent heat ascertained. If it be deemed too cool, a little of the evening's milk which has been reserved is then warmed, so as to produce the heat required: but when none has been reserved, the necessary quantity taken from the tub after the admixture of the two milkings is warmed for that purpose. Little is known amongst the farmers or dairymaids as to the *precise heat* which is best. I have seldom heard the subject named, except by a vague comparison, that such and such dairies were made *colder* or *warmer* than others. I am acquainted with some farmers whose wives are said to have a peculiar method of their own, and who, I believe, obtain a high price for their cheese in the Manchester market, chiefly from the tendency of the cheese to green mould. I know little of the system which these parties adopt, but I understand they make their cheese "cold"—that is, set the milk together at a low temperature; and I am also inclined to think they use less salt than others. I have not solicited the *privilege* of prying into the *mysteries* pursued in these dairies, nor could I expect to have been so indulged if I had, especially if they had supposed it was for publication. It is said these parties get a greater price for their cheese than many of their neighbors, which I have no reason to doubt; and I think, from what I have seen, they make quite as great a quantity per cow. But the *real* price obtained, and the *precise* quantity made in any particular dairy, is seldom known beyond the farmer's own family and the factor.

I ought, perhaps, to state that I have tasted some of these cheeses, and find them generally very good, fair toasters, and without coloring;

* One reason, amongst others, assigned for this (universal) practice, is its tendency to prevent the mischievous effects of the fly.

but in some I have detected a slight sourness: from this cause, or, what is more probable, from too little salt being used, the cheese will not keep long before decomposition takes place.—To the farmer this would only be of consequence in the event of his not being able to sell the article at the time he wished. In the dairies where I have been permitted to take observations, the lowest heat of setting the milk together was 77°. I am disposed to think those who make a so-called *cold cheese* do not adopt much lower temperatures, even in summer, than 74° or 75°; since a much longer time would be occupied in gathering and compacting the curd, and considerable risk incurred of having what is termed a *sour cheese*.

The evening's milk in the tub being at or about 75°, as before stated, and the milk which is brought from the cows 90° or 95°, the temperature of the whole is then found to be somewhere between 80° and 85°; and I am of opinion that the heat at which milk ought to be and is commonly coagulated, ranges between those two temperatures.*

When *coloring* is used, which is not so extensively the case as formerly, it is put into the milk immediately before the rennet. The nature of the article used for this purpose I propose to investigate under a distinct head in the Appendix. The *quantity* of coloring is in some degree regulated by the quality of the milk: if a considerable portion of the cream of the evening's milk has been taken out for making butter, a greater quantity of this coloring matter will be required to give the cheese that appearance which is found necessary to please the *eye* of the consumer, and particularly of those residing in London or at a distance. *Annatto* (or, rather, a coloring matter which *goes by that name*) is the article used; 1 lb. of it for each ton of cheese is a moderate calculation; this would be after the rate of half an ounce to 75 lbs.† The present retail price of the "best *real* Spanish Annatto" is 4s. per lb. The coloring is prepared and applied in different ways, but the most common is to take a piece of the requisite size, to fold it in a small bit of linen, and put it in half or a quarter of a pint of warm water the previous night. By this means it gets sufficiently dissolved. When the infusion is poured into the milk, the linen bag containing it is dipped in, and rubbed betwixt the fingers until the coloring is all discharged. The dregs, if any, remain in the bag.

The *rennet*, or *steep* as it is commonly called, is next added. I have already stated, in the introduction, that this is an infusion made from the preserved stomach or maw of sucking calves, thence called *maw-skins* or *bag-skins*. A recipe for preserving the skins will be found in the Appendix. To define the quantity of rennet sufficient for coagulating a given quantity of milk, is a very difficult matter, as the maw-skins vary so much in quality. When the farmer is laying in a stock for the year, he generally calculates upon a dozen of skins to a ton of cheese; but the skins vary in size, (the price when cured is from 6s. to 9s. per dozen.) In using them, it is the practice often to cut two skins at once. Three square inches taken from the *bottom* (or strongest part) of one, and one or two inches from the top (or weakest part) of the other, is generally found sufficient for sixty gallons of milk. These two pieces of skin are put into a cup containing about half a pint of lukewarm water, with the addition of a tea-spoonful of salt, some part of the day previous to being used. The water thus impregnated with the maw-skin is passed through the sieve into the milk, but the skin itself is generally, though not always, kept out. The rennet-cup is well *scalded* before being used again. I have been told that some farmers make a sufficiently large quantity of rennet to last for several weeks, and find it to answer better than making a small quantity daily. The question is, will it keep *sweet?*

The coloring and rennet having been put in, the milk is well stirred and left to coagulate. It is usual to invert the skimming-dish on the surface of the milk—a practice of doubtful propriety, for this reason, that the curd immediately under it does not attain the same adhesiveness as the other, and is one of the causes of what is commonly called *slip curd*. The tub is now covered up, either with a wooden lid, or with cloths supported by the "cheese ladder;" these assist in preserving the heat of the milk, and protect it from dust and dirt.

The coagulation (or "coming") is generally effected in an hour or an hour and a half. As far as my own observations extend, I am led to think that an average of these two is sufficiently long, if the proper means are used in effecting the formation of the curd: for it is well known that, *cæteris paribus*, the warmer the milk is at the time of setting together, or the stronger the rennet, the sooner will the coagulation take place, but the curd will in consequence be tougher and less in quantity; on the contrary, the cooler the milk, or the weaker the rennet, the longer will the curd be in forming, and the more tender its quality, but its quantity will be greater. By attention to these results the cheese-maker may soon decide when too much or too little rennet has been put in the milk, and correct the quantity the next time. It may be proper here to state that too much rennet has a tendency to impart an unpleasant flavor, or bitterness, to the cheese.

It may generally be expected that the heat of the curd when formed will be four or five degrees less than the milk was when set together; and it is desirable, particularly in cool weather, that this difference should not be greater, otherwise the subsequent labor will be more difficult. To determine exactly when the *curd* is in a fit state for what is called "breaking," requires some practical knowledge; with attention this is soon acquired. The point is generally determined by gently pressing the surface of the milk with the back of the hand, or by lifting up the skimming-dish, beneath which the curd and whey will distinctly appear if the coagulation is complete. Another criterion is the color of the whey, which should be of a pale green.

The "breaking" and "gathering" of the curd

* Since writing the above, I have met with a farmer in Eddisbury Hundred, who says he used the thermometer during the year 1841 for the first time, and that the heat he uniformly adopted was 84°. I also found a thermometer at another dairy near to this, but it was not in use. I was allowed to test the heat of the milk with it, and found it 78°; this was in *June*. The precise heat at which milk ought to be coagulated is a matter of vital importance in cheese-making, and can only be ascertained by a series of careful and judicious experiments made by scientific and practical parties.

† The juice of the yellow carrot and the flower of Marygold are also used for coloring Cheese.

[*Ed. F. L.*

is the next process. This used formerly to be done by means of the hands and skimming dish (a practice still continued in some dairies); but the *curd-breaker* is now generally made use of for this purpose (see Fig. 1). It is made of wire-work, in an oval form, and has a tin rim round it about an inch and a half broad. This wire-work cuts the curd, by being passed through it perpendicularly *very, very* gently at first, and in different directions, so that the whole mass is separated into very small portions. The length of time required for the operation depends upon the quantity of curd: for a 60 pound cheese the operation often takes twenty or twenty-five minutes. After this the curd is left for a quarter of an hour to separate from the whey, and, if the weather be cool, the tub is covered to retain the heat. The curd having separated, which it does by sinking, a portion of the whey at the top is then taken out by the portable brass or tin pan before alluded to, being *pressed* into it, and emptied into the *set-pan*. The curd is then gently broken by the dairy-maid and her assistant passing their hands down to the bottom of the tub, and buoying up a portion of the curd at each time to the surface, or by again using the curd-breaker. The curd having been brought to the top, is easily seized, and separated into smaller portions, and the whey thereby released. This operation takes about half an hour. After the expiration of another half hour (or so soon as the curd is considered sufficiently settled—for there is no saying to five or ten minutes how long each particular interval of rest should be), more whey is taken out, and the curd afterwards drawn as much into one half of the bottom of the tub as its loose texture will admit of.* Upon the curd is then placed a semi-circular board adapted to the size of the tub, with a weight of about 30 pound placed upon it. This board is perforated with holes, about half an inch in diameter, to allow the whey to escape through. The tub is now set three or four inches atilt to drain the whey more readily from the curd, and to admit of its being collected and carried off. The skimming-dish is again required to lade out the whey. The whey, on its way to the set-pan, is passed through a sieve, to collect any curd which may happen to be floating in it. This curd is what is called *slip curd*, which by some is not returned to the tub, for the reason I have before stated. The weight and board are shortly taken off, and such part of the curd as has been squeezed from under them is again collected on one side, and a heavier weight (say 50 or 60 pound) applied as before. As the whey escapes from the curd it is laded out. In the course of a quarter of an hour the board is again removed, the curd cut in intersections of six or eight inches apart, to assist the discharge of the whey, and the board, with additional weights (about double the last), again applied. Some dairy-maids now add the slip curd. The weights are again increased if it be thought necessary: observing always to *let the pressure which is applied be gradual, and regulated by the degree of compactness of the curd*, for if this is not attended to now, as well as afterwards, a considerable portion of butyraceous matter will be forced out and the cheese of course deteriorated.

The curd is again cut into square pieces, taken out of the cheese-tub and broken a little by the hands as it is passed into the "thrusting-tub" (*a*, Figs. 2 and 3). [In some dairies a large-sized cheese-vat, in others a willow basket is substituted for the thrusting-tub.] In this the extraction of the whey is afterwards continued by the application of "the screw," of which there are two or three kinds, but all on the same principle (see Figs. 2 and 3). The old plan of *thrusting*—and from which the *term* is no doubt derived—was by means of a pole four or five yards long, fixed at one end into an upright post, whilst at the other was seated a lusty lad or a man, who kept regularly pressing down the pole upon the curd, the pole acting as a lever. Both poles and men are now almost entirely expelled from the Cheshire dairies; and the *screw* is also likely to be superseded by the "lever press" (Fig. 5). The advantages of this over the screw are, *that it sinks by its own action with the curd—any degree of pressure required can be applied and gradually increased, and less attention is necessary*: whereas the pressure from the screw is sudden and uncertain, and having no self-action, requires the dairy-maid's assistance every five or ten minutes to render it effectual.

The "thrusting-tub," in which the curd has now to be pressed, is round, and is perforated with holes at the sides and bottom for the whey to escape through (see *a*, Figs. 2 and 3). Before the curd is put in, a "cheese-cloth" of the coarsest kind, about one and a half yard long, and a yard wide, (or of dimensions sufficient to contain the curd), is placed in it.* In this the curd, after being broken, as before stated, is enveloped, and a "sinker," or strong circular board, which fits the inside of the tub, placed on it (*b*, Figs. 2 and 3). Upon this the screw (or lever press, if used) is let down, and the power gradually applied.

To assist still further the discharge of the whey, long iron skewers are introduced through the perforations in the tub, with their points directed upwards, so that when the skewers are withdrawn there is a drain made for the whey to follow. These skewers do not remain in more than five or ten minutes; the pressure is continued a little longer. The curd is now cut *through*, in intersections of two or three inches apart, with a large *dull* knife, so as not to injure the cheese-cloth, and the edge or corner of the curd is cut off all round, and placed in the centre. After this the pressure is again applied, and gradually increased, and the skewers introduced and withdrawn as before, after the lapse of about fifteen or twenty minutes. The curd is then taken completely out of the tub, cut into four or five pieces, and each piece broken separately with the hands to about the size of two or three inches square. A clean dry cloth is made use of, the curd folded in it, and again pressed and skewered. These operations are repeated until the whey is sufficiently extracted to admit of the

* At this stage, it is the practice with some dairy-maids, when they suppose the curd is colder or more tender than it ought to be, to return a few gallons of whey after it has been heated over the boiler in the brass pan into the tub again, to assist the discharge of the remaining whey. If, on the contrary, the curd is found warmer than is intended or desirable, which is sometimes the case in hot weather or during thunder, a few gallons of cold water are applied to prevent the curd becoming tough. These inconveniences would, in my opinion, seldom if ever happen if a thermometer was used at first, and the proper heat at that time adhered to.

* *Cheese-cloths* are *linen*, of a rather closer texture than canvass, and made for the purpose. The coarse kind are sometimes termed *screw-cloths*.

curd being *salted*, which is the next part of the process.

If the milk is set together at six o'clock, and the coagulation takes place in an hour and a quarter, the breaking, gathering, and preparation for salting is generally accomplished by eleven or twelve o'clock.

This is merely mentioned as some guide to the *new beginner*, who may not be able to judge from the state of the curd when it is fit for salting. I may here observe that it is the practice in some dairies to salt the curd, whilst, in my opinion, there is *too much whey in it*.

The *quantity of salt* used is regulated by some old custom, or by the fancy or taste of the dairy-maid, and with about as good a chance of correctness as that with which she regulates the temperature of the milk by the touch. That clever and experienced persons may determine the proper quantity of salt in this way tolerably well, I admit: but there are many others who *fall into error*, and all *for want of some fixed rule*. If there be a certain proportion of salt which would answer the purpose best, which there doubtless is, why not ascertain and adopt it?

"In all dairies" (says Mr. Wedge, the author of the original 'Report of the Agriculture of Cheshire,' written many years ago, but still equally true) "the same points are admitted to be essential, but although the means of obtaining those are, upon farms similarly circumstanced, so far alike, as to differ materially in the minutiæ only, yet upon these minutiæ much of the art of cheese-making depends.

"That an exact uniformity does not prevail in every part of the process, is no wonder; for there is not any of the business which is conducted in a dairy which tends to chemical exactness. Where there is no precision, there can be no just comparison; and where no comparison can be made, there exists no foundation for an attempt at uniformity. *The degree of heat at setting the milk together is never measured, the quantity of steep is guessed at*, and its quality not exactly known; *the quantity of salt necessary is undefined, and the sweating or fermenting of the cheese, when made, is accidental.*"

As an antiseptic, a certain quantity of salt is necessary: it is the same in this respect with cheese as it is with butter or bacon. There may be, and no doubt are, differences of opinion, both amongst makers and consumers of cheese, as to the degree of saltness which is best; and it may be necessary, in order to suit the palates of the *many*, that there should be a *variety*. I am willing to admit the force of the argument, so far, that there might be these shades of difference in different dairies, but think that they ought not to exist in one and the same dairy.—Each maker strives at uniformity as regards the *thickness* and *color* of his cheese, and would like also to attain uniformity in flavor if he could. Why not, therefore, measure or weigh the salt before using; regulating the same by the quantity of milk or the weight or quantity of curd!* The former would easily be ascertained by means of a *gauge*, or graduated rod, which any farmer might make for himself, to suit his own cheese-tub. The way to make it would be to pour into the tub a gallon of water, or any liquid, and then to note its hight, and mark it on the rod. This being done, put in another gallon and again mark the hight, and so on until the tub is full; taking care afterwards to introduce the rod into the *same part of the tub*, as the bottoms are not often level.

It has generally been considered that a gallon of milk (supposing little or no cream has been taken from it) will produce upon an average of the season one pound of saleable cheese: that is, when the cheese is four or five months old.—In autumn there is always more curd from the same quantity of milk than at any other part of the season.

During wet weather there will sometimes be more milk than usual, though not a proportionately greater quantity of curd. An experienced dairy-maid soon detects these different results, and makes allowances accordingly. I have met with no dairy-maid who regularly weighs the salt; but a highly-respectable farmer, whose wife makes a first-rate cheese, has given me the weight used in his dairy, as near as the same can be *computed*. It is as follows:—

		lb.	oz.	
In March and April their lb. cheeses average about	30	and ab't 0	10	salt is used.
In May, June and July	70	" 2	0	"
In August	60	" 1	12	"
In September	50	" 1	4	"
In October and November	30	" 0	10	"

In the above instance it will be seen that more in proportion was used in summer than at other times, and that the average is 1 lb. of salt for 40 lbs. of dried cheese (or say forty gallons of milk).

I was favored with an account from another dairy in which, to oblige me, the salt *for once* was weighed. For a cheese which weighed 46 lbs. a few days after making (say 42 lbs. at four months old) 1 lb. 1 oz. was used. This is also after the rate of 1 lb. of salt for 40 lbs. of dried cheese, and was said to be the quantity uniformly used throughout the year in this dairy, which consisted of about forty cows.

A third account is from a dairy of sixteen cows: the quantity of salt used was generally about 1 lb. for 45 lbs. of cheese; but the dairy-maid made a trial last year with one cheese, using only three-quarters of a pound. The cheese was made at the beginning of June, and when weighed in the middle of September was 42 lbs. This cheese was admitted to be better than the others in the same dairy.*

The salt termed the "middle grained" is the kind generally used: but some use "fine." Before applying it the curd is cut into three or four equal-sized pieces, and each of these is broken into smaller pieces by hand, or is passed *once* through the curd-mill† (fig. 4). The salt is then

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* Since writing the above I have learnt that a farmer in South Cheshire, well known for his introduction of improvements in agriculture, has commenced the system of weighing his curd previous to salting it, and he says he uses salt in the proportion of 1 lb. to 42 lbs of curd. He also informs me he sets his milk together by a thermometer, and at a temperature of 76° or 77°.—May, 1845.

* It may not be out of place here to state that at Northwich, which is about the centre of the county, and where the principal salt-works are found, salt is at present bought for 8d. per bushel of 56 lbs. In large quantities the price is considerably lower.

† The *curd-mill* is of recent introduction, and it is only in a few dairies that it is met with: some dairy-maids highly approving, others objecting to it. I think it will soon be more generally adopted, as it effects a saving in time, and breaks the curd more regularly than it can be done by hand.

scattered over it, and the "breaking" continued either by the hands, the curd-mill, or both, until the salt is well intermixed and the curd perfectly crumbled. Each portion as it is broken is put into the cheese-vat, in which has first been placed a clean and rather finer cloth than was used for the previous process, and the curd is compacted as much with the hands as possible, To admit of the curd being properly pressed, it is necessary to put it into such a vat as it will *overfill* by at least two inches. It is also rounded up a little in the middle. The cloth is then brought over it and tucked in at the edges of the vat with a small wooden knife or other dull-edged instrument. In order to support the outside of that part of the curd which is above the vat, and to keep it in proper form when the press is applied, a tin or zinc hoop or "fillet," the edges of which are rounded off so as not to cut the cloth, and the ends lapping over and unattached, so that the same fillet will do for different sizes of cheese, is introduced round the inside of the top of the vat. The "fillet" thus placed sinks with the curd, and having small perforations in it, the emission of the whey is effected through it as through the perforations of the vat. Since it has become the fashion to make Cheshire cheeses *thicker* than they used to be, it is no unusual thing to see fillets six or eight inches broad.

The vat is now again placed under the screw or lever press, and the skewering is also continued. The pressure is increased at intervals, and the skewers inserted in fresh places to accelerate as much as possible the discharge of the remaining whey or "*thrustings*," as it is now termed.

In the course of an hour from the time of salting, the curd is taken from under the screw or lever press and out of the vat, for the purpose of being turned upside down, which is done on a table. In the first place, the angles of that side which was topmost in the vat are cut off; a circular piece, two or three inches deep, is often also scooped out of the centre, and both are broken small with the hands and rounded up in the middle. The cloth being drawn over the curd, the vat is then turned down upon it, and re-turning the vat with the curd in it, the other angles and centre part of the curd are broken in a similar manner: after which the tin fillet is put on, and the screwing and pressing is continued as before for about half an hour or an hour. It will, probably, be two or three o'clock in the afternoon before the curd (or cheese, as it may now be termed) *is got under the press*; that is, when it is removed from the screw to the stone press: but where the lever press is used instead of the screw, which, I think, might always be advantgeously done, all the change that will now be required is a little more weight at the end of the lever.

Before turning the cheese for the purpose of placing it under the press, it is usual to prick it perpendicularly down with a skewer in several places, for the purpose of making drains for the whey, after having been so turned. A clean cloth is applied, and where the lever press is not used the cheese is put under one of the lightest of the other kind. A pressure of six, eight, or ten cwt., according to the size of the cheese, will be sufficient. This is generally accomplished by about two or three o'clock in the afternoon. Smaller skewers are now used, and remain (by removing them occasionally into fresh places) until about four o'clock: they are then withdrawn, but the cheese remains half an hour longer undisturbed, to allow the whey to drain from it. It is then, or some time in the evening, turned, a clean cloth is put over it, and the pressing continued, If the lever press be used, the weight may be a little increased.

On the *second day* the cheese is generally turned twice or three times; it is also skewered, and clean cloths are used each time of turning. I would observe here, that if any of the cloths are used again before they have been washed and dried in the open air, great care should be taken that they be well *scalded*. The presses used for at least the two first days, and, if possible, during the whole process, should be situate in the dairy, kitchen, or some other moderately *warm place*, otherwise the whey will be longer in discharging, and more liable on that account, from the acidity which it soon acquires, to injure the flavor of the cheese. Another advantage of the lever press is, that in cold weather it may be easily moved to a sufficently warm place, which cannot be the case with the common presses. These common presses are chiefly made of one square block of stone fixed in a wooden frame, but are also made of wooden boxes filled with *slag* or other heavy material. They are generally fixed by the walls of the dairy, for the purpose of being stayed to them, and being there most out of the way; when there is not room in the dairy or kitchen, they are placed in the salting room or pantry, which latter places are often much too cold for the purpose, as the whey seldom gets thoroughly extracted when the presses are in cold situations.

On the *third day*, the cheese is again turned once or twice, but ought not to require any skewering. The heaviest press is now had recourse to, and for a cheese of 60 lbs. or 70 lbs. weight about 30 *cwt.* will be pressure sufficient; but some dairy-maids apply as much as two tons, their heaviest press being that weight. A cheese-press of this weight, made of a block of red freestone, would be 3 ft. 2 inches long, 2 ft. 8 inches wide, and 3 ft. 2 inches high.

On the *fourth day*, it is usual in most dairies to discontinue the pressing, but in others it is continued for a day or two longer.

The cheese is then removed to what is called—

THE SALTING AND DRYING-ROOM.—Sometimes these are distinct apartments, but more generally one room suffices for both purposes. The salt can now, of course, be only applied *externally*; and the good, *if any*, effected is to harden the coat of the cheese. The cheese I have before alluded to, as having been made with three-quarters of a pound of salt, and which *was much above an average in quality*, was removed, as an experiment, *direct from the press to the cheese-room*. I am inclined to think this is the better system, or at least that a great deal of the present labor of the salting-house might be dispensed with.

It is, however, only right to state that in most of the dairies of this county the practice of *external salting* still obtains. I will therefore describe the process usually adopted.

The cheese is taken out of the vat, and a strong bandage called a "fillet," about 2 inches broad, and long enough to go three times round the cheese, is used. As this bandage is put on, salt is applied, underneath it, to the coat of the cheese. The bandage is fastened with strong

pins, the cheese placed on stone or wooden shelves or benches, and salt spread on the top to within an inch or two of the edges. The cheese is turned daily, and fresh salt and a clean bandage applied. In some few dairies it is the practice, before the salting above described, to half immerse the cheese for two or three days in strong brine, kept in a shallow tub for that purpose. The salting process above described is continued for various periods: by some for five or six days, by others as long as three weeks. I will give the rule followed by the farmer who furnished me with the particulars of his salting of the curd, (p. 143.) It is as follows:

From the beginning of the season (about March) to the time of the cows being turned out to grass, (12th May,) the cheese remains in salt four days; from thence to the end of July, ten days; in August, eight days; September, six days; and the rest of the season, four days.

It is obvious, from the practice in this dairy, that it is considered necessary for the cheese to remain in salt longer in the middle of summer than at other seasons.

After this salting, the cheese is well wiped or washed, has a clean bandage put round it, and continues in the same room, or an adjoining one, on wooden shelves, for the purpose of being *dried*. It is turned once a day, and remains until it is considered sufficiently dry for being removed to the *cheese-room*. The length of time for keeping cheese in the "drying-house" varies from seven to twenty days; and is regulated by the temperature of the weather, or the *cheese-room* to which it has to be next removed. In hot weather, and especially if the cheese-room is exposed to the heat of the noon-day sun, the change from a *too cold drying-house* (as many often are, except, perhaps, in the middle of summer) to a too hot cheese-room, is calculated to cause *cracks* in the cheese; which said cracks have from time to time to be filled up by the application of bacon-fat, or whey-butter, otherwise mites would soon be generated, and the appearance of the cheese detracted from. To prevent this cracking as much as possible, the salting and drying-houses have rarely, if ever, the windows opened, and drafts or currents of air are thereby prevented. This precaution is also adopted in the cheese-room; and, in addition, the light is excluded either by a shutter or *blind*, as I have before stated.

The cheese I have before alluded to as having been made without any *external salting*, as an experiment, and which *was taken direct from the cheese-press to the cheese-room*, was made in the beginning of June, and at the end of September was ready for the *market*. The quality of the cheese was better than that made in the ordinary way, and all the labor of the salting and drying-house was saved. My own impression is, as I have already hinted, that the drying-rooms are often *too cold*; and that if it is found to be desirable, as perhaps it may be in some dairies, to continue the use of such drying-rooms, the heat should be kept as near as possible at from 50° to 55°. In concluding my remarks on this room, I must not omit to observe that it is necessary the cheeses should remain *bandaged*, in order to prevent their bulging, and also that they should be turned over once a day. If one cheese be made daily, one will consequently—in the course of a certain time after the season of cheese-making commences—have to be removed every day to the *cheese-room*.—When taken to this room, the situation of which I have before described, it is usual to scrape and clean the coat of the cheese, and to place it, in the first instance, in the coolest part of the room—often for a few weeks upon shelves or benches, which are cooler than the floor; subsequently upon the coolest part of the floor, and ultimately upon the warmest part. It is usual to continue the bandage or "fillet" for several weeks after the cheese gets into this room, and indeed in some dairies until it is sold. It is also usual to turn the cheeses, and wipe them with a cloth daily, for at least three or four months, and every alternate day afterwards; and when there are any symptoms of cracking, bacon-fat, hogs'-lard, or some other fatty substance, is applied. The floor of the cheese-room is generally covered with dried rushes, or a coarse grass resembling rushes, called "sniddle," or wheat-straw. The floor should be *level*, otherwise the cheeses will not be kept easily in shape; and should be well washed with hot water and soft soap about twice a-year. The temperature of the cheese-room should, when attainable, range between 60° and 65°. When this is the case, the "first make" will generally be ready for the factor by September or October, and the "latter make" by December or January; but in consequence of many rooms being badly situated and imperfectly heated, the farmer very often does not get his cheese into the market until two or three months after these respective periods.—The object gained in having the cheese-room about the temperature I have named is threefold: the perfect fermentation and ripening of the cheese, the reduction of labor, and the quicker return of *profit*.

It is usual in this county to sell the cheese by what is sometimes termed the *long-hundred*, (120 lbs. to the cwt.) but the factors often require 121 lbs. The price varies with the quality of the article, the state of the market, and the size of the cheese; for large cheeses always sell for more per lb. than smaller ones. There is, perhaps, nothing more difficult to ascertain than the average price of cheese, inasmuch as both farmer and factor make the price a secret. The highest I heard of last season (1843) was 72s. per cwt. of 120 lbs., or a little more than 7d. per lb.; the lowest would probably be about 40s. or 45s.*

Conclusion.—I am aware that a great deal might still be said bearing on this subject. The various defects of cheese, the great difference in the flavor, the effects of different pasturage and food, and various other matters, might be discussed, but it is considered this essay is already too long and tedious. I shall, therefore, content myself by giving the following tabular statement, and the information promised in the Appendix. I cannot, however, close my remarks without expressing my admiration of the industry, cleanliness and frugality of the Cheshire dairymaids. Their labors are great indeed; their cleanliness not to be surpassed; and to their good management it is that the landlord may often consider himself indebted for the *whole of his rent*.

* There is a general wish on the part of the farmers to adopt the standard weight of 112 lbs., but the factors have hitherto in a great measure succeeded in purchasing according to the old custom of 120 lbs. The law for regulating weights and measures has little or no effect in this county, as the numerous customs at variance with that law, and still in operation, bear testimony.

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TABULAR STATEMENT

Of Observations taken at Four Farms in CHESHIRE: *viz., Nos.* 1 *and* 2 *in Bucklow Hundred; No.* 3 *in Nantwich Hundred; and No.* 4 *in Eddesbury Hundred.*

Note.—At Farm No. 1 there are Two Observations.

	Day of Observation.	Number of Cows.	Quantity of Milk at Two Milkings, (except No. 2.)	Heat of Milk when the Rennet was put in.	Quantity of Rennet.	Time occupied in Coagulation.	Heat of Curd and Whey after Coagulation.	Heat of Dairy or Room in which the Cheese was made.	Time occupied in gathering the Curd and completing the formation of the Cheese.	Quantity of Salt used internally.	Weight of Cheese a day or two after making.	Weight at some subsequent period.	Quantity of Cream taken from night's milk.	Quantity of Whey.	Quantity of Whey Cream.	Quantity of "Fleetings."	Size of Cheese.
			Galls.			h. m.			h. m.	lb. oz.	lbs.	lbs.	Qts.	Galls.	Qts.	Qts.	Inch.
No. 1.	Nov. 21.	42	43	83°	About 3 sq. in. of skin, 1 pint of water.	0 50	73° but raised with hot whey to 79°	..	3 0	1 1	55	47 Aug. 17 follow'g.	..	37½	5¾	4	15¾ Diam. 6¼ Deep. Aug. 17.
			Two Cheeses made in two Tubs.	59 / 53									1½	102	13½	..	..
	Aug. 17 following.	48		88° / 86°	3 sq. in. skin, ½ pint of water, to each cheese	1 0 / 1 0	.. / 85°	68° at 7 o'clock.	..	2 4	58¼ / 53	..	..	22	3	3	..
No. 2.	Oct. 13.	10	24 Four Milkings.	78°	3 sq. in. skin, ¾ pint of water.	0 45	74°	..	4 0	0 4	..	..	1	47½	..	..	16 Diam. 7¼ Thick. Aug. 30.
No. 3.	Aug. 10.	26	56	..	..	1 0	..	78° at 11 o'clock.	5 15	1 0	60	..					
No. 4.	Aug. 19.	53	107	77°	12 or 16 sq. in. of skin, 1 pint of water.	1 45	72°	Morn. 64°. Noon 67°.	..	4 4 besides one handful in Milk.	Two Cheeses made; weight not ascertain'd	57 / 53 Sept. 16.	4	98	..	..	15 Diam. 8¼ Thick. 15 Diam. 8 Thick. Sept. 16.

These observations are not so complete as might be wished, not having been taken at the time in a *tabular form*, and with a view to publication.

Note.—Cheese loses about 15 per cent. in weight the first year.

APPENDIX.

THE SCALDING OF THE WHEY, AND THE MAKING OF WHEY-BUTTER.—This process is carried on simultaneously with the making of the cheese. The whey which comes from the curd previous to its being salted is called the *green whey*, and that which is extracted afterwards the *thrustings*, or white whey. The latter are more or less impregnated with salt. As soon as the principal part of the green whey is collected in the *set-pan*, a fire is lighted under it of Cannel coal, crop-wood, or other quick burning fuel. The remainder of the green whey is added after the fire is lighted. It is usual to skim off any small particles of curd which float on the whey, and give them to the poultry.—Whilst the whey is heating it is necessary that it should be frequently stirred, or it will be liable to burn to the bottom of the pan. When it has attained a heat of about 160° or 170°, if any whey is wanted for the family it is then taken out. When the whey has reached the heat of 180° it is in a fit state for *breaking*. This may be effected by any simple acid, but it is customary here to use sour buttermilk, and with it the *thrustings* of the previous day. The quantity of buttermilk necessary may be easily ascertained. I have only noted what was used in one instance, which was 1 pint of buttermilk and 2 quarts of thrustings, (which had been mixed the day previous to being used, and kept in a tolerably warm place to increase the acidity) to 22 gallons of whey. The *breaking* by this method, which is almost instantaneous, has the effect of causing all the creamy matter to rise to the surface, from which it is regularly skimmed off, and put into a cream-mug. The last skimmings are termed *fleetings*, and are generally reserved for the use of the servants. It is necessary, after the *breakings* are put in, to check or withdraw the fire, to prevent the whey from boiling. The refuse whey, after the cream is skimmed off, is ladled out of the pan for the use of the pigs; and it is generally conveyed by a spout fixed above the pan, which leads to a cistern or tub in which the pig-meat is kept.

The making of butter from *whey-cream* varies very little from the process of making butter from the cream of milk. The cream is kept for three or four days, or until it has become clotted (provincially termed *calved*.) Those who make the best whey-butter have a spigot and faucet to each of their cream-mugs to let off the whey, which in the course of a few hours settles at the bottom, and which, if allowed to remain, imparts a rank flavor to the cream, and consequently to the butter. The temperature of the cream, when put into the churn, is generally ascertained by the hand; but if a thermometer be used, the heat which I would recommend is 60°, having found that the best. If it be much *higher* than this, the butter may be expected not only to be soft, but inferior both in quantity and quality; and if much *lower*, the operation of churning will be prolonged, and indeed tedious. At this heat the time in churning will probably be about an hour and a-half. It will perhaps be necessary in cold weather to put hot water into the churn, and in warm weather to put in cold water, in order to attain this desirable object as to heat.

From 100 gallons of milk there will not be less than 90 of whey, which should yield from 10 to 12 gallons of cream, or 3½ to 4 pounds of butter. The quantity of whey-butter per cow is about half a pound per week, taking the season through; but with that small portion of cream of the evening's milk (to which I have alluded at p. 140) added, the farmer often churns as much as three-quarters of a pound of butter per cow per week, or from 20 to 25 lbs. per annum: 1 lb. of salt is sufficient for curing 37 lbs. of butter, if for present use.

CHEESE-COLORING.—This ingredient is or should be *annatto* (or *annotto*), the produce of the *Bixa orellana* of Linnæus. It is, I believe, chiefly imported from the West India Islands, and used for dyeing. The coloring chiefly used in cheese-making is *prepared* by manufacturers in this country for the purpose. It gives the cheese that amber or cream-like appearance which is unfortunately required in order to *please* or *deceive* the eye of the London consumer. For the Manchester and Liverpool markets, and for *home* consumption, the Cheshire farmer rarely uses it in his cheese-making, as it is well known it does not improve, but if an inferior article is bought, and especially if much be used, it may deteriorate the flavor very much. Those who wish to be enlightened on this subject would do well to read the "Essay on Cheese-Coloring," written by Mr. Whitley of Stretton, published by Ridgway, in which it is clearly proved that the greatest bulk of the cheese-coloring used in this country is only an *imitation of annatto*, but sold by that name, and consisting of such ingredients as tumeric powder, potash, and soft soap or train oil, well mixed to form a mass along with a *little* "real Spanish annatto." I cannot, for two reasons, here resist inserting a verbatim copy of a paper which was printed and published several years ago by a cheese-factor in Cheshire: *first*, because it is an acknowledgment, on his part, that much bad coloring did then exist; and, *secondly*, because it contains 'A Word of Advice to the Dairy-maid,' which shows what were considered some of the defects of the dairy system at that time, and what in his opinion the remedies. Many dairy-maids even *now* would do well to attend to this latter advice.

"LOOK YOU HERE, AND BUY ——'S COLORING.—To all that may be concerned in making colored dairies of cheese, —— begs to inform the users of annatto, for the purpose of coloring, that he has for the last ten years felt sorry to his heart for great numbers of dairy-owners, to see such bad colored dairies as he in general has done, and the very great loss the owners thereof have annually met with on this account.

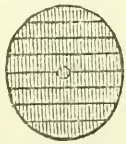
"—— having, therefore, been determined, for the farmers' interest, to use every influence possible with the manufacturers of this article to have the same genuine, which till lately has been to little purpose, as one-half they have in general sent out has proved to be far short of the color which the market requires, he has at last gained considerable information from sundry manufacturers; and he has now engaged a person that has been in the habit of making and seeing this *article made for the period of twenty years* and upwards, and as —— is now in the habit of seeing and hearing what other manufacturers have been and are doing, convinces him that farmers will still find themselves but little better off by following their old mode, he has determined to make the article of annatto in its genuine and original purity, and is now giving the public a favorable opportunity of having some of this very superior coloring, which, from its brilliant color, will recommend to the farmer a great variety of customers for their choicest dairies."

"A WORD OF ADVICE TO THE DAIRY-MAID.—Let your rennet or steep he put into your milk of a temperate heat or warmness. After the curd is formed, do not let any part of it be starved, or get any colder than your own hand.

"All dairy-maids that would have real fine-flavored cheese would do well to thrust it with their hands, that there are no cold draughts from doors upon their curd, but keep it gradually warm, but not to scald it neither with water, whey, nor burning vats. Have your first press not too heavy, and in as moderate a warm place as you can possibly place it; study a warm salting-room; use neither flags nor slates for your cheese to lie on, but good planks; your drying-room to be moderately warm, and also your cheese-room; cold damp rooms, flags, or slates, will spoil the handiwork of the best dairy-maids; you should never suffer your cheese to be starved, or get into a cold damp state, as it very materially hurts the flavor.

"Good calf-skins, or calves' bags, as are invariably made use of, are of serious consequence to the flavor and the coming of the cheese."

A Recipe for Curing the Maw-Skins.—Procure the skins fresh from the butcher the year previous to their being wanted; clean out the chyly matter, and every other apparent impurity; the inside is then turned outward on a table, and salted; the skins are then laid one upon another, with a layer of salt between each, in a deep earthenware vessel similar to a cream-mug; they are then covered over with salt, and have a lid of slate or flag placed on the top. They are taken out as wanted, about a month previous to being used, and the brine drained from them. They are then spread on a table, and fine salt is powdered on each side. In this state they are rolled with a paste-roller, distended with a splint of wood, and hung up to dry.



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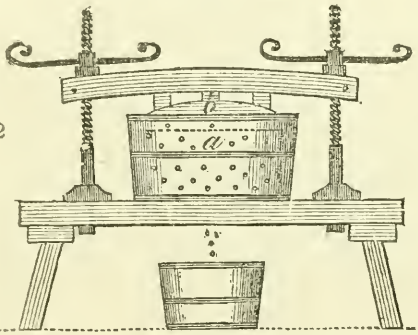

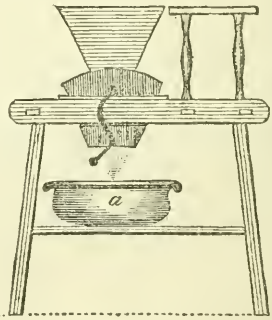

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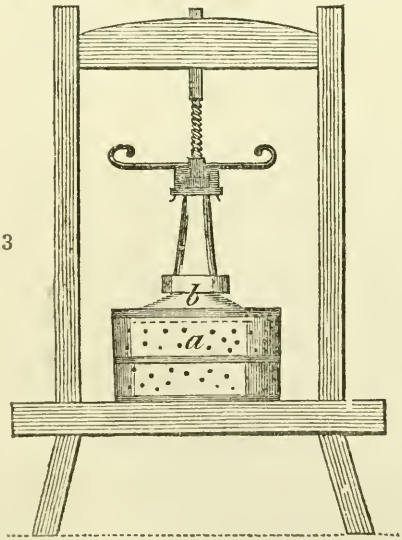

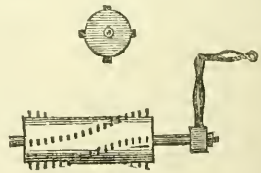

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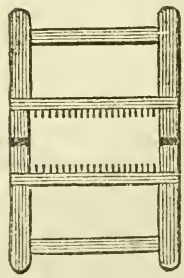

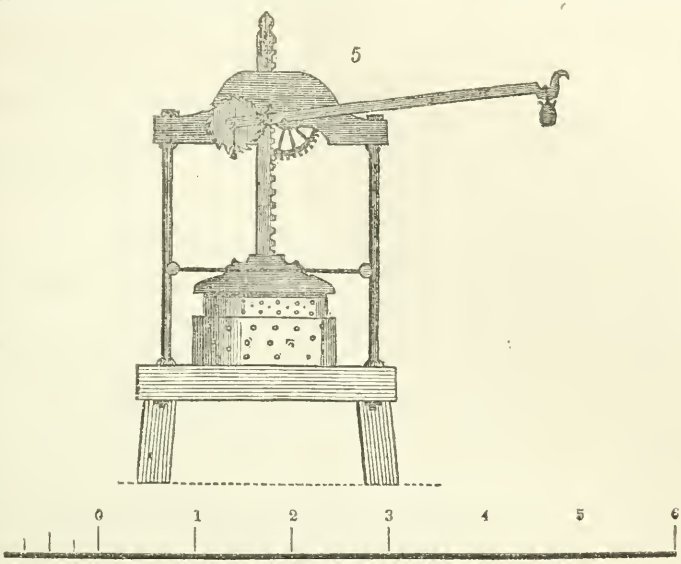

SCALE, 2 Feet to an Inch.

From the London Ag. Gazette of June 21, 1845.

ELECTRO-CULTURE.—A late number, containing a statement of your mode of supplying the electric fluid to plants, appearing to you as good an arrangement as that which I, after much and years of thought directed to the subject, adopted, and which has been since promulgated, will, I hope, be a sufficient excuse for giving some of the reasons why it is not as yet with you attended by beneficial effects. Both the north and the south end of the wire suspended and collecting the electric fluid ought to be in metallic communication with the buried wires, otherwise the circulation of the electricity is intercepted, or nearly so, for I find that the corners of my plots do not affect the magnetised needle similarly; thus, although the south end of the suspended wire attracts the south pole of the needle, and the north end of the wire the north pole of the compass-needle even at some distance, the south-eastern and north-eastern corners of the buried wire both attract the north end of the needle, while the south-western and north-western attract the south pole of the needle; and as this result cannot be obtained with the wires buried and disposed as in your experiment, so also the result cannot be similar to that which it is in my arrangement. Besides, the electric tension of the air has, until the last few days, been so low, that any very perceptible beneficial influence for the last two months could not have reasonably been expected, any more than a windmill would be of use when there exists little or no wind. Experiment on eight acres in one plot has already proved that large areas may be electro-cultured, although as at first advised by me the parallelograms should be longer north and south than they are wide from east to west in the proportion of one to two or three, and every increased width of about 30 to 40 yards, beyond the first 30, should have at least one additional suspended collecting wire. "Beta" observes, that the effect of the electricity extends without the plot surrounded by the buried wire. My observations lead me to believe that it does so in a very limited degree to the eastward, the line of corn improved on that side being concave, or receding from the east in the mid-length of that side, which it was in about the same degree convex, or tending beyond the wire to the west, on that side. The explanation given above why the diverging wires had not the same influence when supplied with electricity as the circumventing wires, also indicates the reason why the effect is so nearly confined to the plot, or area, included by the latter. I would also advise your floricultural readers to have the whole of the buried wires, poles, &c., arranged at once, if not previously done, but not to erect the suspended wire until the flower-buds are beginning to be formed, otherwise the plants will thrive to an unusual extent, as I have seen this year they did in the hands of a friend, and the flowers will in consequence be injured in a degree, while if the additional power is added just as the flower-buds are formed, nearly the whole of the increased supply of fluid will be employed in the development of the flowers, which are, in consequence, larger, more perfect, and the colors more brilliant.

[R. Dewey Forster, Findrassie, near Elgin.

SILK PLANT—GUANO.

LETTER FROM MR. TESCHEMACHER.

BOSTON, 4th August, 1845.

Dear Sir: Two days ago your publishers sent me No. 1 of the Farmers' Library and Monthly Journal of Agriculture, edited by you. Allow me to offer my best wishes for its success, and occasionally a few hints. as the spread of sound agricultural knowledge in this country is an object near to my heart.

Your Silk Plant from Tripoli is an asclepiadeous plant called Gomphocarpus, (from gomphos and karpos, club-fruited); it differs from Asclepias, our milk-weed, merely in the construction of that part of the flower called the corona, and in the club-shaped fruit. I have raised plants here several years ago, but the Summer was hardly long enough to mature the fruit, the silky appendage to the seed, however, is not of sufficient strength to make it valuable for cultivation, and for stuffing cushions it would be very expensive.

Your information on the subject of Guano does not appear to be the result of well-conducted experiments, but of such, where it has been applied, as chance directed. In Mr. Breck's paper (New-England Farmer) last Autumn, I suggested that the Agricultural Society of Massachusetts should offer a handsome premium for the best-conducted Agricultural Experiments on this subject; we should then have had valuable and authentic information. I thought it within the range of their duties; they, I suppose, thought otherwise, and nothing was done. Having myself only a little garden spot, of course it was out of my power to make agricultural experiments, but what could be done in a small garden I have done.

I confess I am surprised to hear of so many failures—*all* which I have been able to investigate, arise from error in application. In no soil but a stiff clay can it fail to produce its effects; in no soil but one amply provided already with phosphate of lime, can its effects fail to be permanent. In arid soils it is, properly applied, of great value, as it infuses that strength and solidity into the juices which enable the plant to withstand the drouth. To this object, one of my experiments has been devoted with perfect success. On a southern bank, my peas were green and fresh, while those of my neighbors, with manure, were brown and burnt up. This, and every other efficient action of Guano, is produced by reflecting on the growth and position of the roots of plants, and placing the Guano in such a situation that they may reach it when they are of a pretty good strength, and the moisture of the soil has sufficiently decomposed the manure; but sowing the seed in contact with Guano, or placing where the young sprouting root touches it immediately, is sure to cause a failure. The same is sure to ensue when the Guano is spread on the surface, so that ammoniacal virtues escape into the atmosphere.

Excuse my troubling you with these hasty lines, and believe me,

Most truly your well-wisher,
J. E. TESCHEMACHER.

JOHN S. SKINNER, Esq.

NATIVE, OR WILD MAIZE.

[From the National Institute.]

WASHINGTON, 15th July, 1845.

My Dear Sir: I send you some pods, containing seeds, of a plant called "Native, or Wild Maize," indigenous to the southern part of Mexico. Specimens of this plant were recently sent by John Black, Esq. U. S. Consul at the City of Mexico, to Mr. Markoe. The Consul says, in his letter accompanying the plants, "From this seed the Maize now in use, is said to have been produced by repetition of plantings." Whether this is true or not, I am not able to say, but am inclined to doubt it.* In this opinion I am sustained by Mr. Rich, Botanist of the Exploring Expedition. It would, however, be interesting to plant the seed, give it a fair trial, and ascertain what changes, if any, it would undergo by cultivation.

Its mode of growth is totally different from that of our common Indian Corn, and it seems to me almost impossible that it should ever even assimilate to it.

With respect and esteem, your friend and obt. sevt.
JNO. K. TOWNSEND.

J. S. SKINNER, Esq.

[* The improvement appears to us not to be greater than has been accomplished by cultivation in some other cases. The plant may be seen at the office of the Farmers' Library.—*Ed.*]

☞ The beautiful illustration of the COTTON PLANT, by Mr. S. B. THORPE, of Louisiana, "taken from life," which adorns this number of the Farmers' Library, will, when the volume is bound, more properly belong to the October number, in which we propose to commence, if not to conclude a sketch of the history and uses of Cotton, from the classical pen of W. B. SEABROOK, Esq., President of the South-Carolina Agricultural Society. In that number, too, we expect to give the first of a series of papers, on the growth and manufacture of the SUGAR CANE, from a gentleman whose pen casts new light on whatever it touches.

THOUGHTS ON TREES AND FLOWERS,

SUGGESTED, OR REVIVED, BY A LETTER FROM A CLERGYMAN.

We give place to the letter from our obliging friend, the Rev. J. O. Choules, with particular pleasure, and the more so, as it seems to warrant the hope that we may regard it, to speak in language that every farmer will understand, as an entering wedge—or, shall we say, as a *nest-egg!* the use and value whereof needs no explanation for one who felicitates himself, as will be seen, that he "has been very successful this year, in raising a large stock of poultry," and almost promises to say his say about *chickens*, for the Farmers' Library.

But we cannot suppress the wish that our friend had dwelt more and longer, as we are sure he might have done with force and elegance, on the science and the virtue of the *love of Trees and Flowers, and of Landscape Gardening*, as eminently worthy of more general and higher cultivation in our country, and yet most greviously and shamefully neglected. Fully impressed, as we are, with the fine effect which would ensue the spread of such a taste, as well on the moral sentiments as on the physical aspect of the country, we should rejoice to have it inculcated, and in every form illustrated through the pages of the Farmers' Library, by one who could so well persuade others to act upon the sentiments, which on that subject, he evidently entertains himself with so much enthusiasm that he would be ever saying, with Sir Walter Scott, to the gardener—"Take care that ye be aye planting a tree!"

In this interesting matter of encouraging and enlightening the public taste for Landscape Gardening, Downing, as we have elsewhere said, is doing for us, what was done with less existing necessity for England, by Repton and Price, and more recently by Loudon; and now, as we are advised by the letter of Mr. Choules, we are to have another book on Trees, to cover the ground, if any which may not have been occupied by the amiable and eminent artist who distinguishes Newburgh by his residence, his trees, his fruits and his flowers; and above all, by making that the centrifugal point for the diffusion of so much elegant and useful knowledge.

Undoubtedly it is in the power of the *Clergy*, as has been well and opportunely suggested by Mr. C. and especially of those resident in the country, to do much in exemplification of the science and the beauties of Arboriculture; and how better could they enforce the spirit of all true religion? For it would be as impossible for oil and vinegar to commingle, spontaneously, as that unmitigated selfishness and misanthrophy should dwell in the same bosom with the love of trees and of flowers. Of this Byron seems to be aware, where thus he seeks, by some redeeming touches, to relieve the desperate character of the greatest Pirate

> "That ever scuttled ship or cut a throat."
> —Old Lambro.

> "Still o'er his mind the influence of the clime
> Shed its Ionian elegance, which show'd
> Its power unconsciously full many a time,—
> A taste seen in the choice of his abode,
> A love of Music and of scenes sublime,
> A pleasure in the gentle stream that flow'd
> Past him in crystal, and *a joy in flowers*,
> Bedew'd his spirit in his calmer hours."

Nor is a partiality for such studies by any means incompatible with the highest degree of literary and scientific attainments. On the contrary, as truly stated by Mr. Downing, in his Historical notices of Landscape Gardening, the glory and merit of the revolution, from the stiff and formal to the easy and natural style of gardening, belong to two among the brightest luminaries of English Literature, Addison and Pope.

To Pope's powerful agency in achieving the great modern reform upon the old angular system practised before his day, in laying off gardens, emphatic testimony is borne too by Horace Walpole in his letters to Sir Horace Mann.

It has, indeed, been affirmed, and the observation is doubtless as just as it is natural, that there is an intimate connexion between Landscape Gardening, Landscape Painting, and Landscape Poetry: it being the province of the first to create, the second to paint, and the third to describe the scene. It is urged that the subjects on which they work, are the same, with this difference, that the range of the Landscape Poet is wider and more varied than those of the others; and is addressed to the eye and the ear, while the others are confined to the impressions made on the mind through the eye. Whence it appears that the Landscape Painter is much indebted to the Landscape Gardener, for the vast variety of pleasing and striking objects that are made to harmonize with each other in scenery which the gardener has brought into view, but which, if

left to nature, could not have been viewed to advantage, nor presented as pleasing objects in Landscapes. For a like reason the Landscape Painter is much indebted to the Landscape Gardener, for concealing objects which are disagreeable to the eye, and for filling up broken defects in a scene which he could not have represented on canvass as a complete whole. The Gardener effects this by planting characteristic trees where the landscape is broken; and also to conceal defects and repulsive objects. These trees become conspicuous objects, and when tastefully disposed, produce a pleasing harmony on which the mind dwells with admiration and delight. The Poet on the other hand, is not less indebted than the Painter to the skill and taste of the Gardener for the harmony and variety of soothing and delightful objects produced by him, which are naturally creative of new ideas, and which enrich his compositions by affording materials for his discription of sublime, picturesque and beautiful scenery.

We ought not, we cannot omit the occasion, to urge upon all who have influence in shaping public opinion, and through it the legislation of the Country, the importance of taking measures for having the arts of design taught in all our schools. How many millions does France levy on the world, entirely owing it to her proficiency in the Fine Arts? How else has she embellished her capital and sent her armies into foreign countries, at an expense that would have otherwise overwhelmed her in bankruptcy, but that her inimitable proficiency in the arts of tasteful invention enables her to sell to other nations the millions on millions of fabrics and manufactures which, with equal cultivation of the arts employed in their preparation, they ought to make at home—who would believe, that with a greater variety and beauty of timber and material for textile fabrics and ornamental household furniture, the United States imported many hundred thousand dollars worth of fine goods and furniture in the last year from France! Why is it that in the fashion of a sofa, a picture-frame, or a sideboard, or a smelling bottle, there should be as much difference between French and English or American design, as between the square and compass style in Landscape Gardening, of "*capability* BROWN," and the easy natural good sense style into which Repton reformed that beautiful art? Clearly because in France the art of design takes the place of Latin and Greek in the general course of education. See how the value of it is illustrated in working up a dollar's cost of flax, into a fabric for which the Princess or the Millionaire pays $1000! Thus it is that she puts the whole world under contribution to her excellence, in those arts which it should be the careful policy of every wise nation to foster—can it then be too often urged that here is to be the great beginning point of reform in our educational systems. We should bend the twig as we would incline the tree. Even the scene-shifter, at first deaf to the charms of music, will in time have his ear attuned to harmony. Already has Yankee ingenuity learned to excel the world in the coarser fabrics until the native troops of Calcutta are seen to strut in Lowell manufacture. We need not the capacity nor docility—what we want is the *taste*, to be created in our public schools, by our public writers, by exhibitions of American Institutes, and above all by wise and liberal legislation.

To return to the art of Landscape Gardening and Drawing—the principles should be taught in every public school in New-York to begin with. Practical Horticulture itself, when properly understood is to be regarded as an intellectual, and therefore, and in that proportion, an honorable pursuit; for even that requires a knowledge of the various kinds of soil, and the action of the different manures, combined with a knowledge of the outlines of botany at least, and of vegetable physiology. But to practice the finer art of Landscape Gardening, and to lay down rules for the improvement of Country Seats and Public Grounds, demands even more than ordinary acquirements, yet not more than might well be taught in its rudiments at least in all our Common Schools, and in its higher degrees in a National Institute, such as the Smithsonian Legacy might and ought to establish and provide for at Washington.

The sooner education in any art or trade is commenced, the greater will be the proficiency—who would think of taking up a lad of twenty to make him a rope-dancer any sooner than a horse in his teens to make him a racer? Would you have your son turn out a Paganini, put the violin in his hands in his earliest youth—so when more difficult arts are to be taught, as painting, for instance, or sculpture, give him the pencil and the chisel as soon as he can use them, and place before him the most beautiful models—inspire his genius and animate his ambition by grand and sublime images from Virgil, Homer, and, above all, MILTON—after all the first to give true and grand conceptions of Landscape Gardening, as he was the first of Poets—lastly, opportunity should be afforded to study, when it can be done, the pictures of the great masters, such as Raphael, Guido, Correggio and others, that he may in these study the magic of design, composition, coloring, &c., and oh! that in our Country, we may see the day, that enlightened public sentiment and reformed legislation shall decree to excellence in the fine arts and in industrial pursuits, the honors and rewards which military despotisms, and some Republics, in servile imitation of them, have reserved so

exclusively for military excellence, and that sometimes of more than doubtful stamp.

To enter on the profession of a Landscape Gardener, a young man should possess, not as we are too apt to suppose, a mere knowledge of reading and writing; he should have a competent knowledge of arithmetic, geometry, and trigonometry. He must learn, as we have had occasion to say before, Landscape Painting, in order to comprehend the true principles of this fine art, and to enable him to draw embellished designs, and to represent the legitimate characters of landscape scenery. He ought to possess, too, some knowledge of architecture, to qualify him to sketch elevations.

But it was not within our design to write a dissertation on this subject. Mr. Downing has supplied that desideratum with great taste and ability. All we can do is to admire what he has done so well, and to raise our feeble voice in favor of more general and adequate provision for instruction, not only in this, but in all the arts of design—arts which may display themselves as well in every article of clothing and furniture; in the trappings alike of the soldier and his steed; in a sand-box or an ink-stand; in the binding of a book, as in the shape of a goblet; in the fashion of a garden-seat, as in the form of the celebrated "mystic urn," about ten inches high and six in its greatest diameter, for which the DUKE OF PORTLAND gave *one thousand guineas!*—known throughout the world as the PORTLAND VASE.

On a late visit to Saratoga, there was nothing which so agreeably impressed us as the evident partiality for trees and flowers, which marks the progress of improvement at that salubrious resort within the last fifteen years—clearly indicating the existence of good taste on the part of the inhabitants and the keepers of the public establishments, while it manifests the general growth of refinement, since these improvements about the hotels are addressed, we may suppose, to the taste of their visiters, and are expected to form agreeable and popular attractions.

It is not easy to measure the influence which a few individuals in any town or neighborhood may exercise in disseminating a partiality for such adornments of the mansion and surrounding grounds; and whose example so likely to prove efficient as that of the Pastor of a country parish, whose profession naturally leads him to look and to point to the visible works of the Creator, as the most captivating and conclusive proofs of His wisdom and beneficence? And, of all the productions of the organic world, what so grand as trees! what so sweet as flowers! so beautiful as birds!—and, may we not add, what country has Providence so bountifully supplied with all these as the Americas! The variety and magnificence of our autumnal scenery have extorted admiration even when beheld by the jaundiced eyes of tourists, as ready to find fault where none exists, as to expose the many which candor must not allow us to repudiate.

In religious history, too often stained with bloody strifes, there is nothing more redeeming and consolatory than the addiction to Horticulture, Floriculture, and rural embellishment, alluded to in all accounts of ecclesiastical life and habits in the early ages:

> "And to his own judicious pains
> The *Vicar's dwelling* and the whole domain
> Owes that presiding aspect which might well
> Attract your notice."

Of what these elegant pursuits owe to the Clergy, there is, to go no further, abundant testimony in the grounds about St. Mary's Seminary at Baltimore, and the Catholic College in Georgetown, D. C., and all know that in the bloody footprints of the conquerors of Peru and Mexico, the Roman Catholic priests followed, as planters of the choicest fruits and vegetables of the Old World. Thus did a Christian Ministry endeavor to efface the remembrance of cruelty and rapine, perpetrated by a Christian Soldiery on the unoffending Natives of America—who, according to PRESCOTT, easily the first of American Historians, had already manifested a passionate love of flowers, and had carried their culture to a high state of excellence. The love of home and the force of patriotic associations in their minds were touchingly evinced in the feelings which Humboldt tells us prompted the Catholic Priests to call around their friends for festive enjoyment over the first bloom and earliest ripening of flowers and fruits which had been brought with them from old Spain.

Vegetable Physiology, including the character and uses of trees, has been the study, as already intimated, of men of the highest eminence among Naturalists, and Poets, and Statesmen; and even learned Jurists have brought this sort of knowledge into professional service—for questions of law, as is well known, have been settled by counting the concentric circles of trees, to determine doubtful boundaries. Thus may trees be said, almost without a figure, to have spoken to the patient truth-searching Chancellor. By their means,

> "————facts and events
> Tuning more punctual, unrecorded facts
> And misstated setting right,"

he has the better succeeded in unraveling and baffling complicated schemes of fraud, and so restored the scales of Justice to their even balance.

The present CHANCELLOR BLAND, of Maryland—a great lover and connoisseur of trees, and neither an indifferent or unlearned student of Vegetable Physiology generally—might, we know, contribute something to the stock of

knowledge on these subjects, if he could take time from his fields and his books.

Cowper, we remember, well indicates, in his affectionate apostrophe to the old "Yardly Oak," which had fallen into decay, not only his knowledge of the physiology of trees, but, in the following lines, shows his estimate of the value of that best of all timber for ship-building:

"Time was, when, settling on thy leaf, a fly
Could shake thee to the root—and time has been
When tempests could not. At thy firmest age
Thou hadst within thy bole solid contents, [deck
That might have ribbed the sides and planked the
Of some flagged admiral; and tortuous arms,
The shipwright's darling treasure, didst present
To the four-quartered winds, robust and bold,
Warped into tough knee-timber, many a load!
But the ax spared thee."

Shall we not gratify many readers, and carry them back to well-remembered youthful days and feelings, by introducing here the last verse of Campbell's "Beech-Tree's Petition"—"Oh leave this barren spot to me"?

"Thrice twenty summers I have seen
The sky grow bright, the forest green;
And many a wintry wind have stood
In bloomless, fruitless solitude,
Since Childhood in my pleasant bower
First spent its sweet and sportive hour—
Since youthful lovers in my shade
Their vows of truth and rapture made,
And on my trunk's surviving frame
Carved many a long-forgotten name.
Oh! by the sighs of gentle sound
First breathed upon this sacred ground—
By all that Love has whispered here,
Or Beauty heard with ravished ear—
As Love's own altar, honor me:
Spare, woodman, spare the beechen tree!"

Decandolle, one of the most celebrated botanists of modern times, has paid great attention to the mode alluded to above, for ascertaining the age of trees by counting the concentric circles.

Humboldt considers a certain Boabab tree of Africa the oldest organic monument of our planet; and Adanson, a distinguished botanist, has, by ingenious calculations, ascertained its age to be 5150. Examples of the species have been seen, it is said, which, with a trunk ninety feet in circumference, were only twelve feet in hight. A still larger was seen by Mr. Golberry in the valley of the two Gagnacs in Africa. It was thirty-four feet in diameter. The flower, says the account before us, is of the same proportions as the tree. A Tree of this species has lately attracted the notice of Mr. WISE, our Minister at Rio, and is the subject of a letter to Mr. Markoe, Secretary of the National Institute. There is a Cypress in Mexico which is said to be one hundred and seventeen feet in circumference, and which the younger Decandolle considers to be even older than the Boabab of Adanson. The Yew is supposed to be the oldest tree in England, where some are growing which are confidently believed to be much older than the introduction of Christianity. The Yew of Brabourn Churchyard, in Kent, has attained the age of 3000 years; but that, says Chambers, at Hedsor, in Bucks, surpasses all others in magnitude and antiquity.—It is in full health, and measures above twenty-seven feet; consequently, according to Decandolle's method of computation, which we have not taken room to describe, this Yew has reached the enormous age of 3240. In all likelihood, this is the most ancient specimen, says our author, of European vegetation.

But without having time or space for half the train of thought lighted up by the letter of our friend, who could so much better do justice to the subject, we must recur once more to the taste for floriculture and tree-culture, displayed in and around Saratoga, to pay a slight tribute to those who have promoted it.

Very little inquiry led us to regard, as among those who had been the most prominent in this praiseworthy employment, Mr. ALEXANDER WALSH, of Lansingburgh, Col. S. YOUNG, a most enlightened and powerful promoter of the cause of Education, Doctor CLARKE, Mr. DAVIDSON, Mr. MARVIN, of the U. States Hotel, and the Messrs. PUTNAM of the Union House, and others in that beautiful village. The grounds of the United States Hotel there are distinguished by the extent and cleanliness of the *lawns*, shaded by the Linden, the Sugar Maple, the Mountain Ash, and other beautiful trees, while the taste of the proprietor of the Union, has besides ornamented his with an assemblage of sweet flowers, enough in variety and character to satisfy even the fanciful demands of Mrs. Hemans, for all the purposes designated in the beautiful lines—"BRING FLOWERS—FRESH FLOWERS." Thus she says:

"Bring flowers to the *captive's* lonely cell—
They have tales of the joyous woods to tell.
* * * * *

"Bring flowers fresh for *the bride to wear*;
They were born to blush in her shining hair.
* * * * *

"Bring flowers—pale flowers—on *the bier to shed*;
A crown for the brow of the early dead.
* * * * *

Closing the utterance of her enthusiastic devotion at the shrine of Flora, by this beautiful invocation:

"Bring flowers to the shrine, where we *kneel in prayer*,
They are Natures offering, their place is *there*;
They speak of hope, to the fainting heart,
With a voice of promise; they come and part;
They sleep in dust, through the wintry hours;
They break forth in glory—bring flowers—bright flowers."

There is a Larch, growing in the neighborhood of Saratoga Lake, so nearly resembling the European as to make it difficult to distinguish between them. There seems to be a sort of capricious sporting irregularity in its fashion of sending out its minor branches single here or there, without rule or uniformity, which is at once un-

common, and therefore, perhaps, more pleasing. A cursory passenger might overlook the native Larch, there called Tamarac, among its neighbors of pines and coniferous trees; but a slight observation serves to disclose its peculiarities, and to recommend it as a tree worthy of transplantation to any more southern residence to which it can be reconciled. That its *habitat* has been heretofore limited, and that it deserves all that we could here say to make it more widely known, suffice it for us, that Mr. WALSH, whose amiable and cultivated enthusiasm in the cultivation of flowers and trees, is so well known, has lately drawn it from its native haunts to give additional charms to his highly ornamented grounds at Lansingburgh, not many miles north of Albany.

We wish it were in our power, in the hope of stimulating others to go and do likewise, to give a catalogue of the very many flowers and trees that serve to embellish the gardens and grounds of Col. S. YOUNG, Mr. A. WALSH, and the gentlemen in Ballston and Saratoga, who have done so much to beautify their respective villages, and to encourage a taste so honorable and praiseworthy; one for which, however, one might suppose sufficient inducement might be found, were it only in providing the attraction and shelter which trees and shrubbery offer to innocent birds, to come around with confidence, and in our very view and hearing sport their loves, and build their nests, and rear their young, and sing their songs. Shall we take room to let the reader admire, once again, how well all this is painted by the Poet of Nature in his lines on the

PAIRING OF BIRDS.

When first the soul of love is sent abroad,
Warm through the vital air, and on the heart
Harmonious seizes, the gay troops begin,
In gallant thought, to plume the painted wing;
And try again the long-forgotten strain,
At first faint-warbled. But no sooner grows
The soft infusion prevalent and wide,
Than, all alive, at once their joy o'erflows
In music unconfin'd. Up springs the lark,
Shrill-voie'd, and loud, the messenger of morn;
Ere yet the shadows fly, he mounted sings
Amid the dawning clouds, and from their haunts
Calls up the tuneful nations. Every copse
Deep-tangled, tree irregular, and bush
Bending with dewy moisture, o'er the heads
Of the coy quiristers that lodge within,
Are prodigal of harmony. The thrush
And wood-lark, o'er the kind-contending throng
Superior heard, run through the sweetest length
Of notes: when listening Philomela deigns
To let them joy, and purposes, in thought
Elate, to make her night excel their day.
The black-bird whistles from the thorny brake;
The mellow bull-finch answers from the grove:
Nor are the linnets, o'er the flowering furze
Pour'd out profusely, silent. Join'd to these,
Innumerous songsters, in the freshening shade
Of new-sprung leaves their modulations mix
Mellifluous. The jay, the rook, the daw,
And each harsh pipe, discordant heard alone,
Aid the full concert: while the stock-dove breathes
A melancholy murmur through the whole.

As a patron of Arboriculture, we might say of Agriculture generally, Mr. LENNOX must excuse the public mention of his name. In a spirit worthy of emulation, he has planted, as we are informed, by a much respected friend of his, not less than *fourteen thousand forest and fruit trees* on his estate, on the left bank of the Hudson. Among these, in ages to come, may be found witnesses of his liberality, more enduring and unequivocal than monuments of marble or brass. The vine, too, that symbol in all ages of plenty and happiness, is there an object of especial attention, being made to beautify his grounds by the curious and fanciful props devised for its support—thus it is that taste is seen to combine grace and utility; and how much better is such employment of time and means, by those who are the favored of fortune, than vexing their lives with continual anxiety to accumulate—*more—more—a little more!* which, after all, must be left behind, to be squandered, finally, by we know not whom; on objects, we know not what? But of all the tenants of our woods, were we to to select one to represent the American forests with most grace and majesty, in a grand Congress of Trees, we should give the commission to an *Elm*, on "ELM-LAND," the estate of JOEL ROOT, Esq. fourteen miles from Saratoga, which measures at its base, 44 feet in circumference, at 3 feet from the ground 22 feet, and at 6 feet from the ground 17 feet, maintaining nearly that size to the height of sixty feet, when its branches commence, and as they rise, spread gracefully, until they overhang an area of 100 feet.

The celebrated Pittsfield Elm, admired and remembered by all who have seen it, and which yet survives a severe stroke of lightning, measures about fourteen feet at three feet from the ground. But were we called on to send to such a Congress of Arborical Sovereigns, a tree that by some magic could be invested with power to give voice to the profound reflections on the history of the various nations and governments of ancient and modern times, which, under its shade, may have had their birth in the solitary musings of its owner; *then* give us the great Elm that overshadows the MARSHFIELD mansion—thus so accurately described by our friend BRECK, of the New-England Farmer.

"The most striking object which meets the eye at first sight, is a majestic Elm tree, near the East corner of the house, which forms a complete bower. It stands on an oval grass plot, which makes a fine carpet for the bower. At a distance of eight or ten feet from the ground, the branches in every direction horizontally, gently curving over till they rest upon the greensward, excepting on the side next the house, where it has been necessary to cut out some of the lower limbs, that carriages may pass to the easter door. The branches on this side nearly touch the house, and form a complete canopy to this entrance. The longest diameter of this tree-bower is 94 feet—perhaps 70 the other way.

Seats are arranged around the tree, near the trunk, where is a most delightful retreat, especially in such a day as was that when we enjoyed its shade, the thermometer indicating the heat as near 90°. The tree is said to have been planted 80 years ago."

THE CLERGY,

THEIR OPPORTUNITIES AND POWER TO IMPROVE THE PUBLIC TASTE FOR AGRICULTURE AND HORTICULTURE.....LETTER FROM REV. J. O. CHOULES.

JAMAICA PLAIN, August, 1845.

My Dear Sir—I have for several days past been trying to get time to tell you how very much I have been gratified with your capital No. 1 of the Farmers' Library, &c. The conception of the work is precisely (I think) what it should be, and the execution of the Magazine very satisfactory. I entertain no doubt respecting its success. I wish it could find its way into the hands of our Clergy; they are of all men possessed of the best opportunities to improve the taste and science of the farmers of our land. Had I the time, I would gladly write an article for your pages, pointing out the claims of Agriculture and Horticulture on the Ministry. I know some of my brethren who feel this subject in all its magnitude; they aim to diffuse correct opinions, cultivate good taste, make *men happier, and places prettier*, because they have lived in the region; and verily they have their reward. For my own part, I would rather get the population of a village all out to plant trees, and beautify the walks and avenues of the hamlet, than convene them to argue upon abstract notions of no possible practical utility. We may learn a great deal that is good from the example of men who went before us. If we dislike the faith, at all events we may admire the taste, of the Churchmen of other days, whose abbeys and cloisters all testify to a sound taste, and whose noble avenues and orchards proclaim good husbandry.

I wish I could set hundreds of men planting trees who seem to delight in worse labors. I do love trees, and I love the men who planted the Elms of New-Haven, Newark, and those of the sweet village I live in. Why does not every man plant out a tree—many trees? In Providence there are some noble Elms which I saw planted only twenty years ago! A man *may see* the result of his labors, and his children would be proud to point out the trees, "the old ancestral trees," of his forefather's planting.—Men may rail at the world as much as they please, but *it is a beautiful one*, and if we are only cheerful and active in it, it will become yet more beautiful. Nearly all the beauty of a residence, a village, a country town, arises from its trees; and not only should every man carefully adorn his own habitat, but men should club together to beautify their vicinage. The strong attachment felt by men in England to homesteads arises in no small degree from the pains which have been taken to adorn and enrich them by a previous generation.

Perhaps my mind has taken this turn from having just been engaged in a cursory perusal of the proof-sheets of Mr. D. J. Browne's charming work on the Trees of America, now in the press, and to be published this winter by one of your most extensive houses. This is really a national work, and its author deserves well of his country.

Each tree is considered principally with reference to its geography and history, soil and situation—its propagation and culture, accidents and diseases, properties and uses—its use in the arts and commerce, and its application to ornament.

The work, as far as I have seen it, more than equals my expectations, both in its literary and scientific merits. The author has devoted many years to the subject, and has availed himself of the opportunity to travel extensively in the United States, as well as in various other countries. It is very evident that ancient and modern works have been rendered subsidiary to the object. The book is not confined to the forest trees of America, but treats of the important fruit and ornamental trees, and these are scientifically and popularly described.

The undertaking, I imagine, cannot fail to be useful and attractive. It will be especially welcome to those who are engaged in commerce, in the construction of ships, public works, or in the mechanic arts where wood is employed.—The whole work is interspersed with numerous historical facts, important to be known, and with many legendary allusions that will prove interesting to the general reader.

I have been very successful this season in raising a large stock of poultry, and I am almost tempted to say my say about chickens. Perhaps I may another time.

Wishing you all success in your important undertaking,

I am, dear sir, yours, very faithfully,
JNO. O. CHOULES.

To J. S. SKINNER, Esq.

THE POETRY OF RURAL LIFE.

THE HOWITTS, MARY, as well as her kinsman, are deserving of honorary membership in every society formed for promoting attention to Agriculture and Horticulture—though they are probably incapable of deciding critically between the merits of Devons and Durhams—though they may not be able to determine, at a glance, the best one in a drove of hogs—one which will take on the most fat, in the shortest time, on the least swill. It can hardly be doubted that their writings are as well fitted to produce a taste for rural pursuits, as though they dwelt exclusively on the peculiar excellencies of certain classes of animals when brought to the test of the milk pail or meat market. Not that we underrate these last—far from it. We go for the *useful* as well as and even a little before the *beautiful*, and in no way do we think we can more effectually promote the useful, than by embellishing it with the beautiful associations of the cultivated minds. It is the very unmitigated grossness that does, or is thought to, characterise too exclusively all farming pursuits, which disgust many men and women, whose example if encouraged would tend essentially to render farming what it ought to be, the most delightful of all pursuits to which taste and intellect can be devoted. We envy not the utilitarianism that excludes every thing of the *imaginative* from the studies of the school and the farm-house; and so far from emulating such a course, we shall act in accordance with our belief that the best interests of Agriculture can be most effectually benefited by contributing to invest country life with all the attractions that can purify the taste, refine the manners, and elevate the intellect of man and woman.

It is in this frame of mind that we seize on a paragraph from some daily paper, eulogising THE TASTE FOR FLOWERS, as an introduction to the beautiful lines of MARY HOWITT, on a similar subject. "We want no better evidence of a good heart than the passionate love of flowers," says the editor, whose name (if we knew it) should have honorable notice at our hands—"a lover of beautiful flowers—flowers in all their elegant variety," he continues, "must needs be a lover of the human species, with a heart open to the griefs of his fellow-beings, and an ear ever ready to hear others' misfortunes, that he may relieve them either by kind sympathy or more substantial demonstrations. We can easily imagine every good quality of the human heart wedded to a proper estimation of flowers. A maiden in her garden is secure from insult and protected against libertine desires. In such a position she can excite no impure thought. A boquet, it seems to us, is a talisman which all ladies would do well to carry. * * * During the week flowers have been plentiful. The markets each morning teemed with the various hues in which Nature has painted her prettiest productions. These flowers were made up, quite tastily, in bunches, and sold for a mere trifle. Consequently almost every market has, for three or four days, been appropriately and refreshingly decorated. We would that June—the month of flowers—had three hundred and sixty days, instead of thirty, allotted to it. Humanity is always more what it should be in June than at any other period."

And now for the beautiful philosophy of MARY HOWITT—the more beautiful that it is clothed in Poetry—as a handsome (by which we mean intelligent) face never looks handsomer than when peeping from under a quaker bonnet.

THE USE OF FLOWERS.

BY MARY HOWITT.

GOD might have made the earth bring forth
Enough for great and small—
The oak tree and the cedar tree—
Without a flower at all.

We might have had enough, enough
For every want of ours,
For luxury, medicine and toil,
And yet have had no flowers.

The ore within the mountain mine
Requireth none to grow,
Nor does it need the lotus flower
To make the river flow.

And clouds might give abundant rain,
The nightly dews might fall,
And the herb that keepeth life in man
Might yet have drunk them all.

Then wherefore, wherefore were they made,
And dyed with rainbow light,
All fashioned with supremest grace,
Up-springing day and night—

Springing in valleys green and low,
And on the mountain high,
And in the silent wilderness,
Where no man passeth by?

Our outward life requires them not—
Then wherefore had they birth?
To minister delight to man—
To beautify the earth—

To comfort man, to whisper hope
Whene'er his faith is dim,
For, *whoso careth for the flowers,*
Will much more care for Him.

TRIALS OF SULPHURIC ACID AND BONES FOR TURNIPS.

BY R. W. PURCHAS.—1845.

	T.	cwt.	lbs
FIELD No. 1.—Soil, sandy loam upon old red sandstone, so completely worn out by the late tenant that a part without any manure, lying between the acre with acid and bones and the acre with dung, produced only, per acre.....	0	5	20
One acre, manured with 160 bushels of turf-ashes wetted with water.....	8	14	32
One acre, manured with 160 bushels of turf-ashes, 2 bushels of fine bone-dust, and 80 lbs. of brown acid (oil of vitriol), costing 12s.; the bones and acid dissolved and treated as below.....	14	5	68
One acre, manured with 20 yards of dung.	14	11	68

This field was limed with 108 bushels of lime per acre in 1842.

FIELD No. 2.—Soil, stone brash upon old red sandstone, limed in 1841.	T.	cwt.	lbs.
One acre, manured with 15 bushels of coal-ashes and 15 bushels of charcoal-dust, drilled in with the seed, produced.....	4	8	64
One acre, manured with 80 lbs. of brown acid and 2 bushels of fine bone-dust dissolved, mixed with 500 gallons of water, and sprinkled with a water-cart over the land before ridging up; and 15 bushels of coal-ashes, and 15 bushels of charcoal-dust, drilled in with the seed.....	12	11	48

The Swedes (Skirving's) were planted on the ridge, the first and second weeks in July, at 24 inches; the plants thinned to 9 inches; horse and hand-hoed three times.

Pulled, topped, tailed, and weighed, 14th January, 1845.

I had the brown sulphuric acid, strength 1·750, at ¾d. per lb., from that highly respectable manufacturer, Mr. James Gibbs, Bristol; and the fine bone-dust, of excellent quality, from Messrs. H. and T. Proctor, Bristol, at 26s. per quarter.

The acid and bones for field No. 1 were treated as follows:—for 1 acre, an empty hogshead of about 100 gallons, with one head out, was used: 2 bushels (or 16 gallons) of bone-dust was put into the cask or tub, then 80 lbs. (or about 4½ gallons) of acid, the mass being well stirred; to this was added 24 gallons of *boiling* water; the mixture being well stirred the whole time the water was being put in, to keep down the violent ebullition that ensued. In a few minutes the bone-dust was perfectly dissolved, and fit for use. The mixture was then taken in the tub into the field, put by the heap of turf-ashes, which being very dry, about 500 gallons of water were gradually added to the mixture, and thrown over the ashes; which, being well mixed, were then put into carts and distributed with a shovel into the drills, the ground ridged up, and immediately sown.

I put in about 3 acres per day, using three old hogsheads or tubs (worth about 5s. each;) and, when taken to the field, two lots were put together, the empty tub being used to mix the proper quantity of water before throwing over the ashes.

A neighboring farmer had one carboy of acid *last* year; he used *dried mud* from a horse-pond to mix with the acid and bones: and he is so satisfied with the result that he has ordered 10 carboys of acid *this* year. My friend says the acid and bones beat every other manure, (guano, dung, &c.;) and are the *cheapest* and best of all manures for growing turnips. The soil, a poor sand, was limed with 108 bushels per acre, immediately before the mixture was put on.

I am convinced that, without lime in the soil, acid and bones will not act; this I witnessed in a neighbor's field last year—the field six years ago was part of a common, it was then broken up, and part limed the following year. Last year the whole field was planted with turnips—using 2 bushels of bone-dust and 80 lbs. of acid per acre; put on as on my field No. 2: the result was, the part limed produced a good crop for the season, beating 15 loads of dung; but the turnips on the part not limed, although coming up well, very soon died away, and in less than a month not a single plant was to be seen.

In the field No. 2, the acid and bones were treated as No. 1; when taken to the field in a water-cask holding 250 gallons of water (twice filled,) was used with half the quantity of mixture, and sprinkled over the land before being ridged up; the ashes were then drilled in with the seed.

His Grace the Duke of Richmond's plan of running the mixture and water *along the drills, after ridging*, is a much better plan than the above; and which, for the future, I shall adopt when using the mixture in a liquid state.

In every trial of acid and bones the turnips came into rough leaf a week before those planted the same day with other manures.

Pilstone, near Chepstow, May 21, 1845.

[Jour. of the Royal Agricul. Society of England.

ON THE USE OF SULPHURIC ACID WITH BONES AS COMPOST.

BY P. DAVIS.

With reference to Mr. Pusey's suggestion as to the propriety of using bone-dust (dissolved in sulphuric acid) along with *compost* instead of *water* for turnips, I can confirm his idea from practice, having last year manured 5 acres with only 13 bushels of bone-dust dissolved in 270 lbs. of sulphuric acid and 150 gallons of water. After standing twenty-four hours, the liquid was mixed with 3 cart-loads of *coal-ashes*, and left to remain for a week, during which time it was turned over two or three times. The mixture was then drilled along with the seed, and the result was a fair crop of common turnips, off a piece of poor land, without other manure, and at the cost of only 12s. 9d. per acre.

Milton House, near Pembridge, Herefordshire, April 25, 1845. [Ib.

EDITOR'S TABLE.

LATE PUBLICATIONS
ON AGRICULTURE AND KINDRED SUBJECTS.

We have already intimated, that if we had time to enter into a thorough examination of them, we might yet not deem it expedient to remark very critically on the contents and practical value of the books which it may be the pleasure of publishers, from time to time, to place on our table—That duty is left with more propriety, and in better hands, as it seems to us, with the regular reviewers of the Literature of the Country—of which it is no longer a question, Agricultural Literature is to form an interesting department.

We are prepared furthermore to say, that so limited are yet the offerings of our Booksellers, in works on Agriculture and Natural History, that Farmers might well buy them all at a venture, and even then their Libraries would not *begin* to compare with that of the Lawyer, the Doctor, or the well-bred, educated Merchant.

Except the American Institute and the New-York State Agricultural Society, we know of no association of Farmers possessing a Library, though we doubt not that in Boston, deservedly called the Athens of America, there must be such a collection of Agricultural works. While this is the reproachful truth, as to the follower of the pursuit from which all others draw their life's blood, how many volumes does the Farmer suppose there are in the hall of the *Mercantile* Library Association of New-York?—answer—21,312! with every necessary appointment and facility to enjoy the treasures they contain. When will Agriculturists awaken to a full sense of the dignity and the wants of their profession, and to what is yet to be done to secure for it that predominance of intellectual and political power, which ought to flow from and correspond with their superior numbers and their productive labors, preponderating as they do over that of all other classes united?

Johnson's Agricultural Chemistry—Republished by Wiley & Putnam in 2 vols. 4 parts, pp. 619, with an Appendix of 90 pages.

This is a work which professes to be written for "practical Farmers," and all who are of that category ought to have it, for it must be valuable if it correspond with the well-founded fame and the avowed purposes of the author; whose numerous titles affixed to his name indicate close associations with the sciences that serve to elucidate the principles of agriculture. The author is more modest than some men we wot of, wise in their own conceit, for he admits that he does not know *quite every thing*. There are, says he, "many mysteries connected with the Nature and Phenomena of vegetable life, which we have been unable as yet to induce Nature to reveal to us." But, he eloquently adds, "the morning light is already kindling on the tops of the mountains, and we may hope the deepest valleys will not forever remain obscure." Truly, dame Nature must be very inexorable if, at the rate she is now being interrogated by the votaries of science, she does not reveal her most hidden secrets. To his remark, quoted above, Mr. Johnson appends this curious note,—"The roots of trees will travel to comparatively great distances and in various directions in search of water: the roots of *San-foin* (Esparette) will penetrate 10 or 12 feet through the calcareous rubbly soil, or down the fissures of limestone rocks in which they delight to grow."—Is this, he asks, the result of some perceptive power in the plant, or is it merely by accident that the roots display these tendencies.

Those who are in any degree acquainted with the speculations of the German Physiologists of the greatest name, in regard to the *soul*, and even the immortality of plants, will not accuse me of going *very* far in alluding to the posble existence of some such perceptive power. Von Martins gets rid of objectors by speaking of them as "scientific men to whom the power of comprehending the transcental *has been imparted in a lower degree!*"

The Botanical Text Book, for Colleges and private Students.

This is an American Work, by Asa Gray, M. D. "Fisher, Professor of Natural History in Harvard University." The author has rendered an important service if he has given us a Book in fulfilment of its TITLE, and this we have a right to presume he has done, seeing that he occupies a most honorable Chair in the most renowned University of our country.

There are few in the United States, who have done more, and that in a manner so disinterested, to promote the study of Botany than Doct. Darlington of West-Chester, Pa. On some future occasion we may use his arguments to en-

force the study of such books as the one before us. We remember that in a Lecture addressed to the *Ladies'* Botanical Society of Wilmington, Del. (to her great honor, be it known that she can boast such an association,) he employs the persuasive remark of the Roman Orator who said—"These studies are the intellectual nourishment of youth, and the cheering recreation of age; they adorn prosperity, and are the solace and refuge of adversity; they are pleasant at home, and are no incumbrance abroad—they abide with us by night, go with us in all our travels, and lend additional charms to the attractions of our rural retreats." The strongest recommendation of this study is, in fact, that it is one which is well adapted to the *female* mind, condition and pursuits. "Its cultivation imposes no tax upon the feelings, involves no cruelty, shocks no sensibility, all its incidents and attributes are promotive of corporeal health and pure intellectual pleasure."

DOWNING'S COTTAGE RESIDENCES, Or a series of Designs for Rural Cottages and Cottage Villas, and their Gardens and Grounds; adapted to North America.

This volume of near 200 pages, so well printed and illustrated, which was offered to the American and English public, by the same Publishers, and which went to its second edition in 1844, is already too well known and too popular to need further notice. The plans of buildings and grounds look beautiful on paper, and in any deviation from the common style, if style it may be called where style there is none, there can scarcely be any harm done. One common shame of the country is, that instead of having a portico or piazza, as it is usually called in the country, to at least every side of the house exposed to the sun, in a hot arid climate like ours, the body or frame of the house is usually exposed to its intense heat, without the protection even of trees. We could find it in our hearts to make such omission in building, any where South of New York, an indictable offence. We still want a book or essay, with illustrations descriptive of the *cheapest houses that can be built for people of the smallest means.* How easy would it be to have a portico or roof resting simply on four posts, to even every laborers hut in the land, and what a comfort to have such a place to sit, and have their children playing around them, in the open air, and yet free from exposure to rain, and to the direct rays of a scorching sun! But the subject is worthy of and shall have more special attention.

A TREATISE ON THE THEORY AND PRACTICE OF LANDSCAPE GARDENING.

This is a work by the same author and from the same publishers. Mr. DOWNING is doing for us, who were more in need of such works, what LOUDON has been doing for England. The view in the grounds at Blithewood, Dutchess County, which makes the beautiful frontispiece to this Treatise, offers an irresistible temptation to know all about the Book, while it bespeaks our confidence in the fine feelings and taste of the Author.

His work on Fruit Trees was briefly noticed in our first number, since which, those here referred to have been placed in the Library of the "FARMERS' LIBRARY."

☞ STEWART'S STABLE ECONOMY has been laid on our table by D. Appleton & Co. Comprehensive as is the title, the book contains much more than it would seem to import. This, too, is a reprint from the third English edition, and has the eminent advantage of having been prepared with additions by Mr. Allen of the American Agriculturist, giving it great additional value for American readers. "In editing this work," says Mr. Allen, "I have suppressed a few whole pages, all of which were either quite erroneous in matters of fact, or totally inapplicable to this country. About the same quantity suppressed, has been added by me, which is enclosed in brackets."

BLITHEWOOD.—*Residence of Robert Donaldson, Esq. of Dutchess County, as represented in "Downing's Landscape Gardening."*—Of Mr. Donaldson's taste and magnificent spirit for the embellishment of rural life, the public has been well and widely made acquainted in the already justly celebrated work of Mr. Downing on Landscape Gardening, of which Blithewood forms the beautiful frontispiece.

As far as the Farmers' Library may circulate and endure, its influence shall not, we are determined, be wanting to spread a knowledge of what may be done to promote, in our country, the growth of pursuits that cannot fail

"To raise the genius and to mend the heart."

While the general press of the country is employed, with all its power, in elevating Statesmen to distinction, and demagogues to the level of Statesmen—while the universal public voice is ready to shout its praises in honor of Military pretensions, let it be the province of those whose duty it is to watch over the interests of Agriculture, and the arts of peace, to claim consideration and precedence for those whose partialities and tastes lead them, like the Proprietor of Blithewood, to illustrate pursuits that tend to the refinement of public sentiment, and the promotion of public happiness. Such are the men whom it is alike the interest and the glory of Republics to distinguish. Herodotus, the Father of History, relates what, on this point, it would well become us to remember. He tells us how

the Ionians were once visited with new calamities from Miletus and from Naxos. Of all the islands, Naxos was the happiest, but Miletus was at that time in the hight of its prosperity.—In the two preceding ages it had been considerably weakened by internal factions, but its tranquility was finally restored by the interposition of the Parians, whom the Milesians had preferred on this occasion to all others, and who, being called on for their good offices, applied the following remedy: They sent as ambassadors men of the highest distinction, who, perceiving on their arrival at Miletus that the whole State was involved in extreme confusion, desired permission to examine the internal condition of their territories; and whenever, in their progress through this desolate country, they observed a farm *well cultivated*, they wrote down the name of the owner. In the whole district, however, they found but few estates so managed. Returning to Miletus, they called an assembly of the people, and placed the direction of affairs in the hands of those who had best cultivated their lands; for they concluded that they would be most watchful of the public interest who had taken the best care of their own. They enjoined all the Milesians who had before been turbulent and factious to obey these successful farmers, and the general tranquility was speedily restored.

These good farmers were in all probability educated men, who, disgusted with the corruption of trading politicians and the sway of impious men, had withdrawn from public affairs, to find quiet if not consolation on their own well-managed farms. But look at our legislative assemblies, and all our public trusts, and mark in what small proportion those who fill them are usually *taken from the ranks of practical husbandmen*; and this is more especially the case in States where education is the least diffused.

The July number of the Cultivator contains a fine specimen of American Engraving, in the Portrait of a Bull, the property of ROBERT DONALDSON, Esq.

ENTOMOLOGY AND BOTANY.—The sciences of Entomology and Botany are cultivated with exemplary assiduity by so few, that we feel in a measure called on to mention the names of G. B. SMITH, M. D., of Baltimore, and Doctor JOSEPH E. MUSE, of Cambridge, Maryland, who have successfully associated these with other useful and liberal studies. We have been favored with a recent discourse by Dr. Muse, addressed to the Dorchester Farmers' Club, containing observations of much interest on various subjects, and, among others, on a *new variety of insects then threatening the Wheat crop*; and on experiments in the application of Electricity to Agriculture. We can only take room now for what he says, we are sure in just praise, of the "American Journal of Agriculture and Science," lately established at Albany, N. Y., and conducted by Doctors EMMONS and PRIME, gentlemen of eminence in science.—Of this Journal the Doctor further says—and there need be no better judge—"it has commenced, in its second number, a series of articles upon insects injurious to vegetables, with descriptions and colored figures of the insects. Price, $3 per year. This Journal should have a place in every Farmer's library." We shall ask of the publishers the favor of an exchange.

AGRICULTURAL CONVENTIONS.—Among other sensible resolutions, adopted by one lately held at Columbus, Ohio, was one to petition the Legislature to pass a law to *tax dogs*, in the hope of diminishing the great number of worthless curs that infest every part of the country, and by their ravages present great obstacles to the successful progress of Sheep-husbandry in Ohio. The same reasons exist for similar acts in many other States. Such resolutions sound well on paper; their expediency is obvious to every man of common sense. It is safe to assume that millions of dollars are annually lost to the nation, not so much by the number of Sheep killed as by restraining many from breeding Sheep, in the fear of their being thus destroyed. But, alas! these half starved, hungry dogs are, in many cases, kept in great numbers as companions, by loafers yet more worthless, who, if they have nothing else, *have votes!*

HON. ZADOC PRATT.—With his usual munificence in the encouragement of all useful institutions and enterprizes, this gentleman, who retired from the public service too soon for the public good, has sent his check for $250 to the Greene County Agricultural Society, (which has the benefit of his Presidency,) to be distributed in premiums. This liberal donation was accompanied with sagacious and patriotic suggestions as to objects most worthy of being fostered by the Society. For these we have not room, having previously given out enough to fill the September number. But if ever this worthy gentleman *should* die—which we hope never to *hear* of—we will assuredly endeavor to preserve, in the Farmers' Library, the striking features of his physiognomy and character—Let others pay their homage to those who are successful in the Forum and the Battle-field; we go for honoring the *friends of the plow!*

Maryland Coal.—This, too, is a matter that will not escape our attention. If any one asks how Coal-mining is connected with Agriculture, we answer, in the same way that Manufactures are. They both call for laborers, who must be subsisted on the produce of Agriculture; and much more, at present, does it behoove the landholders of Maryland and Virginia to have *in their vicinity*, as in Massachusetts, thousands on thousands swarming about their water-falls and their coal-mines, to *consume* their produce, already redundant, than to discover the means of adding to that redundance by increased production.

The nearer these consumers are to the producers, the better for the producing interest—for it is that interest, as has been well and strongly intimated by Mr. Stevenson, which pays the tax of transportation. "Our produce," says he, "until it reaches the market of exportation, does not change its character of interest; it is still the Planter's, and only becomes an article of Commerce when it touches the hand of the Merchant. The transportation, therefore, to market is as intimately connected with its value as any process of its previous preparation; and the Planter and Farmer have, therefore, a deep interest in the improvement of the internal navigation of the country." Is it not, then, obviously to their advantage that their produce should be consumed as near the field of its growth as possible—for the same reason that the market gardeners are all found near the towns, because they can undersell those at a distance from it? And, since the cost of transportation, "until it touches the hand of the Merchant," is a tax on the producer, is it not his interest that his wheat and his wool should be manufactured as near him as possible, and there put into a shape as condensed and portable as can be? Hence, is it not clear that not a pound of wool or flax or cotton, or a bushel of wheat, should pass, in a raw state, by any locality where there is suitable power to manufacture and people to consume it?

As to the Cumberland Coal, we have been well assured that great quantities of it would meet with ready sale, at a price not exceeding eight dollars per ton, *if it could be had*; but it appears that no adequate (if any) provision has been made to get it brought round from Baltimore or Washington. Is this, too, another case where every thing is to be done by—*talking!*

Manufactures in the South.—The Richmond Whig of the 27th June, under the head, "Wool-Growing," contains this remarkable disclosure:

"This branch of Agriculture is now beginning to attract the attention of Farmers all through the South, and we are determined that, so far as we are concerned, it shall also deserve the notice of Agriculturists in this State.—*Now that we see and hear of Manufactories springing up in every part of the State—and, indeed, almost every part of other Southern States—it behooves all who take an interest in the prosperity of such enterprises, to be unceasing in their efforts to give strength and encouragement to them.*"

[Communicated.]

Destruction of the Mulberry by Frost. We have advices of the destruction of the *Morus Multicaulis* to a most alarming extent.—The greater portion of those growing above the 42° N. latitude, from the best information we have received, are destroyed. This will be a serious blow to the Silk interest.

It is all important that we obtain trees sufficiently hardy to withstand one severe Winter—otherwise great sacrifices will, every now and then, fall on the Silk culturists, and the benefits of this new staple, promising so much, will be rendered precarious, and discourage undertakers. We have always apprehended trouble in our Northern climate in relying on the Morus Multicaulis.

At the Ninth Annual Fair of the American Institute, the Brussa Mulberry was first introduced by Charles Rhind, Esq., obtained from the foot of Mount Caucasus, in Turkey; and there was evidence produced showing that these trees had withstood our severe winters, when the Multicaulis, with the same exposure, was completely killed. We want information. Will gentlemen who have cultivated the Brussa supply it? We believe they have passed the last Winter unharmed.

The leaf is not so large as the Multicaulis, but much thicker, and, it was stated, preferred by the Silk-worm; and the cocoons obtained by feeding on them were exhibited, of a large and beautiful kind.

Some of the genuine kind may, no doubt, still be identified, as there was a public sale of a large quantity at Newburgh. Judge Buel, Whitmarsh, &c. were purchasers.

For more particulars, see vol. 3 of Journal of American Institute, page 447, and references.

An Item for Cotton Planters.—The London Ag. Gaz. June 7, thus answers an inquiry:

"We agree with you as to the importance of this subject, and are obliged to you for the letter. But are you not aware that the East India Company has recently incurred large charges in bettering the Cotton cultivation in India, by sending out American seeds and American planters? and that the quality of Indian Cotton has become very greatly improved in consequence? You will find plenty of information on the subject in the proceedings of the Agri-Horticultural Society of India."

VEGETABLE PHYSIOLOGY AND ELECTRICITY.

PETZHOLDT'S Agricultural Chemistry, is of itself sufficient to justify public confidence in the 'Farmers' Library,' as a work which is to elevate the character of the farmer by inducing the application of scientific principles, and a method of investigation to his routine of daily duties. The only way to elevate (not in Mike Fink's phrase, when he told his brother, who was shooting the tin cup off his head, 'to *elevate* his gun a little *lower*,') the farmer is to throw into his way such information as will first teach him that there are errors in his present system, and that, not only these errors are to be corrected, but that new methods of farming and new applications of old substances, and the discovery of new ones, either as pabulum for plants or modifications of the texture of the soil can only be the result of scientific study and experiment. Petzholdt has been well selected for this object. The greatest objection to the work is the want of a proper Glossary, which I prophesy will also be the case with most future publications of this kind. Even *this* reader felt the necessity of a fuller one, although some years since, Chemistry had formed a part of his system of studies. I propose, at some early period, to supply that deficiency, if not done more satisfactorily by some one having more leisure and preparation. In the mean time I beg leave to make an extract from the 'Botanic Garden' of Dr. Darwin, *the Poet and the Physiologist of Nature.* The 'Botanic Garden' was published in 1781, and the lines selected embrace two subjects, which are thought worthy of discussion: the one by Petzholdt in Lecture VIII, on the Carbon of Plants, and the other at page 109 of your Monthly Journal, entitled 'Electricity applied to Agriculture and Horticulture.' Darwin was a man of genius, and his own age did not comprehend him. His prophesy on steam has been substantially realized, and his 'Loves of the Plants,' is the school-boy's philosophy of the Botanist. But to the extract and the notes which are taken from Part I, Canto 1. lines 457 to 472, calling "from their long repose the Vernal Hours."

"On wings of flame, *ethereal virgins!* sweep
O'er Earth's fair bosom and complacent deep;
Where dwell my vegetative powers benumb'd,
In buds imprison'd, or in bulbs intomb'd,
Pervade *pellucid Forms!* their cold retreat,
Ray from bright urns your viewless floods of *heat;*
From Earth's deep wastes *electric* torrents pour,
Or shed from Heaven the scintillating shower;
Pierce the dull root, relax its fibre trains,
Thaw the thick blood, which lingers in its veins;
Melt with warm breath the fragrant gums that bind
The expanding foliage in its scaly rind;
And as in air the laughing leaflets play,
And turn their shining blossoms to the ray,
Nymphs! with sweet smile, each opening flower invite,
And on its damask eyelids pour the light."

Line 462. The fluid matter of heat, or calorique, in which all bodies are immersed, is as necessary to vegetable as to animal existence. It is not yet determinable whether heat and light be different materials, or modifications of the same materials, as they have properties in common. They appear to be, both of them, necessary to vegetable health, since, without light, green vegetables first become yellow; that is, they lose the blue color, which contributed to produce the green; and afterwards they also lose the yellow and become white; as is seen in cellery blanched or etiolated for the table by excluding the light from it.

The upper surface of leaves, which I suppose to be their organ of respiration, seems to require light as well as air; since plants which grow in windows, on the inside of houses, are equally solicitous to turn the upper side of their leaves to the light. Vegetables, at the same time, exude or perspire a great quantity from their leaves, as animals do from their lungs; this perspirable matter, as it rises from their fine vessels, (perhaps much finer than the pores of animal skin,) is divided into inconceivable tenuity, and when acted upon by the Sun's light, appears to be decomposed; the hydrogen becomes a part of the vegetable, composing oils or resins; and the oxygen combined with light or calorique, ascends, producing the pure part of the atmosphere, or vital air. Hence, during the light of day, vegetables give up more pure air than their respiration injures (see Petzholdt,) but not so in the night, even though equally exposed to warmth. This single fact would seem to show that light is essentially different from heat; and it is perhaps by its combination with bodies, that their combined or latent heat is set at liberty. [Your readers can pursue this and similar points in additional note XXXIV, and in the notes generally.]

Line 463. *Electric torrents pour. The influence of Electricity in forwarding the germination of plants and their growth seems to be pretty well established,* though Mr. Ingenhouz did not succeed in his experiments, and thence doubts the success of others; and though M. Rouland, from his new experiments, believes that neither positive nor negative electricity increases vegetation, both which philosophers had previously been supporters of the contrary doctrine; for *many other* naturalists have since repeated their experiments relative to this object, and their new results have confirmed their former ones. Mr. D'Ormay, and the two Roziers, have found the same success in numerous experiments which they have made in the last two years; and Mr. Carmoy has shown, in a convincing manner, that electricity accelerates germination.

"Mr. D'Ormay not only found various seeds to vegetate sooner and to grow taller, which were put upon his insulated table and supplied with electricity, but also, that silkworms began

to spin much sooner which were kept electrified, than those of the same batch, which were kept in the same place and manner, except that they were not electrified. These experiments of Mr. D'Ormay are detailed at length in the Journal de Physique, of Rozier, Tome XXXV, p. 270.

"M. Bartholon, who had before written a tract on this subject, and *proposed ingenious methods for applying Electricity to Agriculture and Gardening*, has also repeated numerous experiments; and shows both that natural electricity, as well as the artificial, increases the growth of plants and the germination of seeds; and opposes Mr. Ingenhouz, by very numerous and conclusive facts.—Ib. Tome XXXV, p. 401.

"Since, by the late discoveries or opinions of the chemists, there is reason to believe that water is decomposed in the vessels of vegetables; and that the hydrogen or inflammable air, of which it in part consists, contributes to the nourishment of the plant, and to the production of its oils, resins and gums, sugar, &c.; and, lastly, *as electricity decomposes water into these two airs, termed Oxygen and Hydrogen*, there is a powerful analogy to induce us to believe that it accelerates or contributes to the growth of vegetation, and, like heat, may possibly enter into combination with many bodies, or form the basis of some yet unrealized acid."

So much of Darwin; the true point, I imagine, in the philosophy of electrical Agriculture, is contained in the italics of the last paragraph, and would seem to sustain, in a great measure, the views of Mr. Seely, pp. 53, 54, of your July Journal, viz: that Electricity, if at all available, is a mere *exciting* agent, and that the texture of the soil and the pabulum of plants must be supplied from other elements of Nature.

Ohio Co. Va. CULTOR.

[Cultor is a Correspondent so much to our taste, that we should like to look behind his mask, in the hope that we might the better encourage him not only to give the fuller glossary of which he speaks, but to favor us with observations, such as the pages of the Farmers' Library may suggest on other subjects. We are quite sure that he might assist us materially in the accomplishment of designs far above and more worthy than that of merely gaining adequate pecuniary support. Supposing him to be already a subscriber to the work, and not knowing how else to reach him with a fuller expression of our hopes and aspirations, in this respect, we have addressed a letter to "CULTOR," care of the Postmaster at Wheeling, who, we hope, may still be our old friend AGNEW, if he desire it; which letter he (Cultor) will please call for. Here we can take room only to add that he cannot well excel us in admiration of the genius and forecasting mind of Darwin.—*Ed.*]

PRICES CURRENT.

[*Corrected, August 20, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort.....℔ 100 lb.	3 75	@	3 81¼
Pearls, 1st sort, '45.....	4 06¼	@	4 12½
BEESWAX—American Yellow	— 29	@	— 29½
CANDLES—Mould, Tallow..℔ lb...	— 9	@	— 11
Sperm, Eastern and City.....	— 27	@	— 29
COTTON—From.....	— 6½	@	— 10
COTTON BAGGING—American...	— 13	@	— —
CORDAGE—American.....@ lb.	— 11	@	— 12
DOMESTIC GOODS—Shirtings, ℔ y.	— 5	@	— 11
Sheetings.....	— 6½	@	— 15
FEATHERS—American, live.....	— 27	@	— 32
FLAX—American	— 6½	@	— 7½
FLOUR & MEAL—Genesee, ℔ bbl.	4 50	@	— —
Troy.....	4 43¾	@	4 50
Michigan	4 37½	@	4 43¾
Ohio, flat hoop	4 37½	@	4 43¾
Ohio, Heywood & Venice.....	5 —	@	5 12½
Ohio, via New-Orleans.....	4 —	@	4 12½
Pennsylvania.....	4 62½	@	4 75
Brandywine.....	4 62½	@	4 75
Georgetown.....	4 75	@	— —
Baltimore City Mills.....	4 62½	@	4 75
Richmond City Mills.....	6 —	@	— —
Richmond Country.....	4 62½	@	4 75
Alexandria, Petersburg, &c.....	4 62½	@	4 75
Rye Flour	3 —	@	3 25
Corn Meal, Jersey and Brand.....	2 31¼	@	2 56¼
Corn Meal, Brandywine.....hhd,	11 62½	@	11 75
GRAIN—Wheat, Western..℔ bush.	— 90	@	1 —
Wheat, Southern.....	— 85	@	— 92
Rye, Northern.....	— —	@	— 70
Corn, Jersey and North...(meas.)	— 60	@	— 63
Corn Southern.....(measure)	— —	@	— 56
Corn, Southern.....(weight)	— —	@	— 60
Oats, Northern.....	— 40	@	— 41
Oats, Southern.....	— 34	@	— 36
HAY—North River.....bales	— 75	@	1 —
HEMP—American, dew rotted...ton	85 —	@	97 50
" " water rotted.....125	—	@	175 —
HOPS—1st sort, 1841.....	— 12½	@	— 15½
IRON—American Pig, No. 1.....	35 —	@	37 50
" Common.....	32 50	@	35 —
LIME—Thomaston.....℔ bbl,	— 80	@	— —
LUMBER—Boards, N.R., ℔ M. ft. clr.	30 —	@	35 —
Boards, Eastern Pine.....	10 —	@	11 —
Boards, Albany Pine.....℔ pce.	— 7	@	— 17
Plank, Georgia Pine.....℔ M. ft.	33 —	@	35 —
Staves, White Oak, pipe.....	45 —	@	— —
Staves, White Oak, hhd.....	37 —	@	— —
Staves, White Oak, bbl.....	28 —	@	— —
Staves, Red Oak, hhd.....	27 —	@	28 —
Hoops.....	25 —	@	30 —
Scantling, Pine, Eastern.....	14 —	@	16 —
Scantling, Oak.....	30 —	@	35 —
Timber, Oak.....℔ cubic foot	— 25	@	— 37
Timber, White Pine.....	— 18	@	— 25
Timber, Georgia Yellow Pine	— 35	@	— 40
Shingles, 18 in.....℔ bunch	1 50	@	2 —
Shingles, Cedar, 3 feet, 1st quality.	22 —	@	24 —
Shingles, Cedar, 3 feet, 2d quality.	20 —	@	22 —
Shingles, Cedar, 2 feet, 1st quality.	— —	@	17 50
Shingles, Cedar, 2 feet, 2d quality.	15 —	@	16 —
Shingles, Cypress, 2 feet.....	11 —	@	13 —
Shingles, Company.....	— —	@	30 —
MUSTARD—American	— 16	@	— 31
NAILS—Wrought, 6d to 20d...℔ lb.	— 10	@	— 12½
Cut, 4d to 40d.....	— 4¼	@	— 4½
PLASTER PARIS—℔ ton.....	2 50	@	2 62½
PROVISIONS—Beef, M., new ℔ bbl.	9 —	@	9 75
Beef, Prime, ...	5 75	@	6 —
Pork, Mess, Ohio, old and new....	13 —	@	13 62½
Pork, Prime, Ohio, old and new..	10 25	@	10 75
Lard, Ohio.....℔ lb.	— 7¼	@	— 8½
Hams, Pickled.....	— 7	@	— 7¼
Shoulders, Pickled	— —	@	— 5
Sides, Pickled.....	— 6	@	— 6¼
Beef, Smoked.....℔ lb.	— 8	@	— 8½
Butter, Orange County	— 18	@	— 22
Butter, Western Dairy.....	— 15	@	— 16
Butter, ordinary.....	— 12	@	— 13
Cheese, in casks and boxes.....	— 6	@	— 7
SEEDS—Clover.....℔ lb.	— 8¾	@	— 9½
Timothy.....℔ tierce	14 —	@	17 —
Flax, Rough.....	8 —	@	8 50
SOAP—N. York, Brown.....℔ lb.	— 3½	@	— 5½
TALLOW—American, Rendered...	— 7	@	— 7½
TOBACCO—Virginia.....@ lb.	— 2¾	@	— 6
North Carolina.....	— 2¾	@	— 5
Kentucky and Missouri.....	— 2¾	@	— 7
WOOL—Am. Saxony, Fleece..℔ lb.	— 33	@	— 34
American, Full Blood Merino.....	— 28	@	— 29
American ½ and ¾ Merino.....	— 24	@	— 27
American Native and ¼ Merino...	— 24	@	— 25
Superfine, Pulled.....	— 30	@	31 —

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PORTRAIT AND MEMOIR OF JUSTUS LIEBIG.

WHAT better proof is needed of increasing public respect for industrial pursuits, than is found in the honors that the world is beginning to pay to men of genius who are accelerating the progress of improvement in these pursuits, by their important discoveries?

Time was when the laurel was not fitted for the crown until it had been sprinkled with human blood; but thanks, as we may hope, to a more enlightened public opinion, the highest honors are now to be reserved for those whose labors most multiply the means of subsistence and comfort for increasing populations.

Under the influence of this happy change of public sentiment, we see with pleasure in recent English periodicals, of the highest character for talents and authority, the *Portraits and Biographies* of men whose minds and lives have been devoted with most efficiency to *the cause of the Plow*. To a lead so honorable we have already evinced our readiness to follow in the *Farmers' Library*. If it had not been that we learned when it was too late, that the friend who had been relied on to prepare an Agricultural Biography of Judge PETERS, had been prevented by sickness from taking it in hand, we should have endeavored to present in this number the Portrait and Memoir of some other eminent American friend of the cause; as it is, we concluded to try the art of lithography on the Portrait of JUSTUS LIEBIG, for which, foreigner as he is, we trust no apology will be needed; for, as we have before said, the *Plow* is of no party, or religion, or country; on its fruits all classes must live, of whatever creed or clime. Moreover, it may be well presumed that all persons acquainted with the progress of literature and scientific discovery in the great business of Agriculture, would like to have a nearer and more personal acquaintance with the author of a work, in respect to which the most eminent chemists in Europe and America, embracing Professor Webster, the able American Editor, concur in opinion, that the information it contains is of great amount, and that "from its publication may be dated a new era in the art of Agriculture."

While this desire to have, as it were, a personal introduction to men whose usefulness brings them into eminence, is but the offspring of a natural and salutary curiosity, their very liability to be thus exposed and scrutinized should exert a wholesome influence on the mind and habits of all young persons from the time when they are capable of reflection, and become inspired, as every one should, with ambition to be distinguished. In such habits, leading to excellence, are to be found the first dawnings of the mind and earliest development of the character of great men; such, for example, as WASHINGTON and FRANKLIN, and ADAMS, whose very copy-books, with their "pot-hooks and hangers," were preserved and are still extant.

BIOGRAPHICAL SKETCH OF DR. J. LIEBIG.

BY DR. SMITH, FORMERLY HIS PUPIL.

DARMSTADT is but little known to Englishmen, and until Mr. Murray wrote his "Handbook of Germany," and showed us the best mode of traveling along the Bergstrasse, few Englishmen troubled the little Grand Duchy; but now the formal, straight streets, in an English bath-town fashion, proclaim the intimacy of our German cousins with their wandering relations in the so-called "haughty island." In this town Justus Liebig was born, 1803. It would be unjust to say that no other remarkable thing has of late happened here; a town which shows, that however unknown to us, it is not ignorant of us, nor of many modes of advancing its citizens, which England itself seems not to have dreamed of. The father of Justus Liebig was, and is a "materialist," or a colorman, approach-

ing to what we term also a "drysalter;" and we here see the reason of the early attention paid by the boy to chemical pursuits. The interest excited by his father's experiments, seems to have founded in him such a permanent love of similar pursuits, that no one, advising him to the contrary, was able to influence his mind in any degree. Nor can his father now, when he looks with pride on the son who has so highly educated himself, refrain from thinking, as we hope many others will think with him, that the early predilections of childhood are not to be disregarded in choosing a path for future pursuit. True it is that the studies of the Gymnasium were forgotten, or almost entirely neglected, and that Virgil and Horace were not appreciated; but the teachers of the Gymnasium, like other teachers, failed to perceive that there are some studies of value which do not come under their province; and that the Latin and Greek of the olden time, beautiful as is their literature, must never dare to oppose themselves to the rapid growth of that knowledge, which is, as it were, a continuation of the creation of things, inasmuch as it opens to us truths which have for ages remained as if uncalled into existence.

At the age of fourteen, Justus knew well all that had been done in the science; had read all the books the library could give on the subject; and let no one suppose that Darmstadt not being so large as London, cannot so well supply the student with books; and Manchester, Liverpool, and Birmingham, though able to compete with it in money, cannot compete with it in literary treasures. Not that any offence is meant to Darmstadt, in comparing it for a moment with these English towns in a literary point of view; but it would be well for us to know that many as are the booksellers in England, but a small number of towns can boast of establishments such as many places which we might call villages, are supplied with in Germany. At this age, Liebig had also experimented as much as his means would allow him, and had, no doubt, a good knowledge of chemistry, whilst the impressions made on his youthful mind could not easily be effaced, growing as they did with his growth, and familiar as a game of marbles or of cricket. The usual method of learning chemistry then, as it is also unfortunately in England, was to go to an apothecary's shop, and accordingly Liebig followed this course.

It was with little encouragement that this course was undertaken; but it was the only mode left, as at school he was considered a dunce, not giving any attention to languages, and not being gifted with so much of what the phrenologists call "Imitation," as to glide easily into any form of speech or into any language used by others. I prefer saying that he is deficient in imitation, as he does show great fluency of speech, and has a peculiarly expressive style of his own, which could not be the case were it mere deficiency in language. (See Prof. Gregory's remarks in the Phren. Journ. on "Prof. Liebig's Development.")

Reuling was his fellow-boobie at school, and is now distinguished as a musician at Vienna.

Liebig remained only ten months at the apothecary's in Heppenheim, near Darmstadt, finding that chemistry, as a science, was as far off as ever in that mode of proceeding. After six months' preparatory study at home, he went to the University of Bonn, then to Erlangen, studying under Kastner in the latter place.—Here he became acquainted with many who followed different as well as similar pursuits; and the influence of the lectures of Schelling he has often expressed to have been strong, and to have been hurtful to him in the study of physics; but probably the elevated sentiments of Schelling have not been without advantage in raising the character of the chemist, and giving it that extended influence and those higher tendencies, unknown to its earlier followers. To keep alive his knowledge and sharpen his reasoning powers on the subject, he formed a society among the students of Bonn and Erlangen, for discussing chemical and physical subjects. We have been unable to procure the first papers written by him whilst at Erlangen, on the action of alkalies, on fulminating silver, and on some coloring matters; both are types of his future labors, as he has shone so much in illustrating the action of bodies, which seem to act by laws somewhat different from the ordinary attraction then known. We are not informed by what channel the talents of the young man were made known to the Grand Duke Lewis I. of Darmstadt; but in 1822 he was liberally furnished by him with means to prosecute his studies in Paris. Here he attended Gay Lussac, Thenard Dulong, and others, and made acquaintance with the principal chemists now his cotemporaries in Germany. His talents having recommended him to De Humboldt, many advantages in the prosecution of his studies and his investigations were given him; and a more intimate acquaintance with Gay Lussac, caused by the recommendation of the same great philosopher, was followed by an investigation into the fulminates; a work which had for some time engaged his attention, and which was now undertaken in the private laboratory of Gay Lussac, and published under their joint names.

In 1824, in his twenty-first year, by the recommendation of De Humboldt, he determined to teach the science, and took means to obtain the necessary degrees. He was, in the same year, made extraordinary professor of chemistry at Giesen, and in two years after, ordinary professor. The place of extraordinary professor is that of lecturer or tutor, and is the first step made towards a professorship in Germany. There the station of professorship is fixed upon by young men, and they follow it step by step as they would any other occupation, and is not, as here, the chance result of patronage and hard-earned fame, although they felt it necessary to labor hard to find a claim, and they are seldom fixed upon before having made themselves somewhat known. They are, however, generally taken out of this body. Were I to give a list of the labors of Liebig in chemistry, it would be too long for this article, and at the same time uninteresting to all but chemists. He was tutored into fitness to speak on organic combinations, as may be seen from the investigation made into such substances as hippuric acid, which he discovered, kinic acid, camphor and camphoric acid, lactic, malic, and aspartic acid, with their products of decomposition; in many instances tracing them from the highly organized state to the lower, where they approach more inorganic compounds. We see this especially in his investigation of ether, alcohol, aldehyd, and the numberless compounds of cyanogen; whilst the more purely organic part, such as sugar, was not forgotten.

Professor Liebig is a great admirer of our distinguished chemist, Davy; and the lives of the two are intimately connected as far as science

goes. When examining the nature of hydrochloric and hydriodic acids, Davy gave it out as probable that the acidifying principle is not, as was supposed, oxygen, but hydrogen. In the above-mentioned acids it is easily seen, and he wished to extend it to others also. Liebig, in his inquiry into the nature of organic acids, has found a wider range of comparison, and has set in a point of view which few persons are now inclined to contradict, and which all must find to be a beautiful explanation of an extensive class of natural appearances.

He says. "hydrated acids are compounds of one or more elements with hydrogen, in which hydrogen may be replaced by metals."

If an acid be so constituted, the hydrogen, capable of being replaced by a metal, is the true measure of the capacity of saturation; the remaining elements may then be termed the *radical*, as chlorine or iodine in the cases of hydrochloric and hydriodic acids. If this be the case, any addition of elements to the radical will have no effect on the capacity of saturation.

"But if the hydrogen increases or diminishes, the capacity of saturation increases and diminishes in a like ratio."

"If the above definition of a radical be correct, we see that any addition to it will have no effect on the capacity of saturation of the acid, so long as the amount of hydrogen remains unaltered."

In conformity with this principle, he has used in his work on organic chemistry this formula for acetate of Soda—for example, $\overline{A}c$ Na 0;—whereas, we are accustomed generally to use base first, as Na 0 × So 3, for sulphate of soda. This theory has also been fully extended by Professor Graham, who has taught us the true position of water and bases in inorganic salts, and has termed sulphuric acid sulphate of water, just as green vitriol is termed sulphate of the oxide of iron. The first is So 3 × H 0; the second, So 3 × Fe 0; the iron in one takes the place of the hydrogen in the other. But this subject is not one likely to be of much practical use at present. The substitution of the alkalies is of more interest.

An idea prevails among us that Liebig is a farming chemist only; that his greatest pleasure is to see beautiful fields manured in a chemical manner, and growing wheat and turnips according to the exact methods which he has laid down. In this we are mistaken; Professor Liebig is a philosopher, or, according to the German expression, a searcher of nature; and the great experience which many years devoted to organic chemistry had given him in the modes of operation of such bodies, whilst it peculiarly fitted him for investigating agricultural and physiological subjects, naturally also led him into them. At the earlier part of this century the *laws of combination* were developed. The chief workers in this field are still living—numerous compounds were formed and obtained formed in nature; but inorganic chemistry was chiefly studied, and the most highly organized substances were treated in the same manner as compounds of sulphuric acid and iron, or any other mineral substance. Boyle, or rather the chemists of his time, analyzed a piece of green wood by putting it up the chimney, when it burned, and they perceived four elements—fire, air, earth, and water—which we are apt to say were combined by a vital vegetable principle: one of these facts is as near the truth as the other, for facts we may call them, as, however imperfectly expressed, they fall within the borders of received truth. If we analyze organic compounds, and obtain from them instead of fire a certain amount of specific heat; instead of air, a certain amount of nitrogen; and, instead of earth and water, a certain amount of phosphates, silicates, oxygen, and hydrogen: we express the true compositions of the body more accurately than the friends of Boyle, but we are no wiser as to the laws of growth and decay, no nearer to the principles which vitality employs to exhibit its various appearances; because vitality itself had ceased prior to the view which we have obtained of the elements employed in its service. If, however, having collected these facts, having obtained a knowledge of the complex organic compounds which are used for the phenomena of life, we begin to observe their action towards each other, we have ascended into a region as far above the former, as the complicated machinery of kingdoms, such as England, France, or Germany, is above the simple relations of unsocial, independent, and walled villages of earlier times. The physiology of plants and animals is then a step in advance of the usually termed organic chemistry, and when we are taught the parts albumen or sugar play in the system, we have more knowledge and more power than when we can merely tell their composition. It is well known that this field has received from Professor Liebig the first cultivation—that the first regular crop was sown and reaped by his hands. It is vain for us to say that others before him saw so far; it is not unfrequently the case, that the end is seen long before any of the intermediate stations.—Absolute certainty often arrives before clear reasoning, and it is often hard for us to prove the most unquestionable truths. It is from this cause that many discoveries have been claimed for men who named them only, but could not prosecute them, that the dark hints given in ancient volumes have seemed to some men to indicate a superior knowledge to our days, that a metaphysical inquirer has been honored as the discoverer of the atomic theory, although ignorant of chemical combination; and Egyptians been made the discoverers of the laws of acoustics, because they had an image which emitted sounds, by laws which we have not yet learned to put in motion.

Davy said, "The laws of mind are probably not far different from the laws of corpuscular motion; every change in our sensations must be accompanied by a corresponding change in the organic motion of the body."

This he said when but a youth, and it is a very good instance of the mode in which immense series of discoveries are often anticipated by speculative men. It not only may be said to include what has been discovered, but grasps at much that we may safely expect some day to be known. It anticipates the time when the action of our feelings on the system shall be perfectly known, and almost leaves as an insignificant thing the action of the food, of the air, and of exercise. To teach us how to find some of this knowledge, and to give us the first fruits, has been the task of Professor Liebig; and already has the whole of this country, with many others, arisen unanimously, to express by the most energetic action, the lively impression of truth, which the principles taught by him have made upon them. The farmer no longer supposes that barren land can become fertile by dipping the seed to be sown in a solution of a salt,

and the physician no longer expects that he can feed a child, without disastrous consequences, on mere starch or arrow-root. The fact is now established, that land without the elements of fertility, must have them given to it, before it can be fertile; and that to form nerve or muscle in the body, food containing their elements must be taken.

If it be said that to the study of physiology a knowledge of the composition of organic bodies was an important preparation, it may also be added that a knowledge of the elementary composition of bodies was much more easily obtained by the facilities of analysis introduced by Liebig.

Many persons may have seen attached to one of his best portraits, which was lithographed at Frankfort five years ago, a small crooked-looking apparatus on one side of him, in which five globes with white spots on them are the principal things seen: this is the potash apparatus, a series of bulbs in which caustic potash is put to collect the carbonic acid passing from the decomposing organic matter undergoing analysis. It is scarcely right to connect his name in such a marked manner with an invention so much inferior to his many other labors, but that also speaks a truth not to be forgotten easily, and makes us believe that the gratitude of one who had labored with little profit at less elegant apparatus had offered this to him, although on an unlucky part of the sacred niche.

As a life spent like that of Professor Liebig can offer little for the writer, unless what is either directly or indirectly connected with science, it will be better for us to look over that which he has done, and to give the true reasons of the great name he has acquired.

The chemical section of the British Association desired him to prepare a report on the state of organic chemistry. If we look at the work which resulted, well known under the title of "Chemistry in its applications to Agriculture and Physiology," we perceive, that in considering the state of organic chemistry, and collecting the information on the various branches it includes, he was led to generalize; and by embracing many phenomena as he did in a few simple ideas, he has given us a resting-place hitherto unforseen; and although the vanguard only may have arrived in quarters, and room be not ready for every arrival, it is no more than we must always expect, as another march must sooner or later be made. "He has endeavored to develop in a manner corresponding to the present state of science, the fundamental principles of chemistry in general, and the laws of organic chemistry in particular, in their applications to Agriculture and Physiology, to the causes of fermentation, decay, and putrefaction, to the vinous and acetous fermentations, and to nitrification. The conversion of woody fibre into wood and mineral coal, the nature of poisons, contagions, and miasmas, and the causes of their action on the living organism, have been elucidated in their chemical relations."

This is somewhat more than the association expected of him, an analysis of the existing theories and facts would have satisfied them.

It may be useful to repeat some of the more striking parts of it:—

Plants are formed of carbon, hydrogen, oxygen and nitrogen, phosphorus, sulphur, and several metallic oxides, such as those that occur in soil. Carbon and hydrogen are never absent from plants—they are found in every portion of the plant, and increase together; oxygen is present almost as generally, and constitutes a large portion of the fibre of wood, and of the nutritive portion of the plant. The oxygen contained in woody fibre, sugar, gum, and starch, that is in the much larger portion of the vegetable world, is in the same proportion to the hydrogen contained, as in water; that is to say, if we take the hydrogen and oxygen from them, the compound obtained will be simply water, and carbon will be left; they may then be said to be compounds of carbon with water, although there are many objections to viewing them in this light. Nitrogen is a constituent of all gluten, albumen, and casein, substances essential to our food; along with it sulphur and phosphorus are always found, and several metallic oxides, such as lime, magnesia, iron oxide, soda, and potash, are never absent. Whence do all these substances come, may now be asked? First, the carbon: it was long supposed to be given to the plant by means of humus: humic acid, or ulmic acid, a known matter to be seen in mould, and to be obtained in large quantities from decayed woods, and other vegetable matter. Rich mould was generally seen to contain a great deal of this; and it was supposed that the plants imbibed it merely, and digested it: that this could not possibly be the case, is shown from its almost insolubility in water.

Humus has been analyzed by various persons—none, however, have come to certain results; the differences amount to as much as twenty per cent. of carbon; but they all agree in giving it a large portion. We can form it artificially in various ways; that is, by various decompositions of organic matter, by treating woody fibre with alkalies, or sugar and starch with acids.—It is organic matter approaching an inorganic state, and in which we may consider vegetable life to be entirely extinct. Vegetables, when they die, undergo decomposition; by means of the oxygen of the air they are gradually burnt, the carbon unites with the oxygen, the hydrogen and oxygen assume the usual form in which they exist, uncombined with carbon, viz: water; and as this takes place, the remaining mass approaches more and more an unorganized charcoal merely. Such a condition is highly favorable to its farther union with oxygen, the bond which held it together, its vegetable life, being now gone, it naturally returns to the state in which only it can be useful to other plants, viz: carbonic acid. It is a destruction of our analogies to suppose that a vegetable can live on the decayed matter of another; the true position of the plant seems to be to form from the mineral world organized matter.

Glauber, an old chemist, if not alchemist, of the seventeenth century, was the first to observe that plants fed on any of the gases or earths. It is remarkable that no one has attended to his discoveries; he placed a plant in a jar of carbonic acid gas, and found, after a time, that the gas had become oxygen. It is right that in mentioning the works of the present day, we should not forget the labors of the past. The time will come when two centuries will be a distance too small to be regarded, and Glauber, Saussure, and Liebig, will be mentioned more as co-workers, than as a series of workers. The same chemist also taught the value of several mineral salts in growing plants. But after the composition of carbonic acid was known, Saussure, Davy, and others have shown that carbonic acid is converted by plants into oxygen gas, a suffi-

cient proof that they have formed their structure from it. Saussure showed that the upper strata of the air contained more carbonic acid than the lower—a fact, the contrary of which is generally believed; also, that by night there is more carbonic acid in the atmosphere than by day.—Now, plants in the absence of light, are incapable of converting the carbon of carbonic acid to their own use, or at least in very small quantities, so that what they do absorb, or have absorbed, is given out at night unchanged. Of the sources of oxygen and hydrogen in plants, not much need be said here. The fact of the decomposition of water, in order to obtain a surplus of hydrogen for certain compounds, such as the oily, resinous, &c. seems beyond doubt, and the presence of oxygen in the plant can be accounted for in several ways. The assimilation of both of these substances presents phenomena very instructive; but that of nitrogen being somewhat more so, and having given rise to the most original theories and extensive discussion, may with advantage be looked to for a moment. It is well known that Davy considered ammonia as of great importance in manures, and proposed plans for preserving it; but having given him his due, and not forgetting our friend Glauber, who saw this thing as clearly as any man could, unacquainted with modern analysis, we must now give the rest of the praise to Professor Liebig, who showed that it is the inorganic state into which azotized organic matter enters to render it capable of a second organization; and that whilst Nature uses the atmosphere as a reservoir of the *decomposed*, she likewise uses it as a reservoir of food for the *composing* vegetables.

If ammonia be the last product of the transformation of azotized bodies, it is, of course, to be looked for in the atmosphere. As ammonia is very soluble in water, it must be then washed down by the rain; and after a long drouth we may expect that the rain will wash down a considerable quantity. The ammonia was looked for by Professor Liebig in a shower of rain, and it was found; and it has even been obtained with the peculiar smell of organic matter attached to it. The quantity contained in the atmosphere has been estimated as one-quarter of a grain in 1,132 cubic feet. In hot climates the nitrogen is found combined with oxygen, so as to form nitric acid; since the full value of the nitrogen in these compounds has been seen, we have had a change, not in the theory merely, but in the whole practice of our farmers; and the trade occasioned by it has been sufficient to employ some hundred vessels at a time, and considerably to alter our ideas of the value of many waste products in the arts. Its indirect influence is no less valuable, as the guano of our own country, the waste matter of our own towns, husbanded as it ought to be, will not only be sufficient to supply the farmer when the foreign guano is spent, but the removal of it will purify our streets and our streams, and in no small measure add to our domestic comfort, and our sanitary condition.

The true valueof in organic matter, as manure, is especially insisted on by Liebig; the necessity for phosphates, sulphates, and silicates, has been a guide in the management of the rotation of crops, which will, when fully followed out, prevent much loss of time, and prevent any pity being thrown away on poor land, which we say is weary of such hard labor. Hard labor cannot be sustained without good food; this we must give the ground, and food is never so expensive as to be unable to pay itself by increase of strength.

Phosphates and silicates are the most necessary inorganic salts, which our soils in general want; sulphates are more easily procured in the form of gypsum. We may obtain phosphates by using bones, although a cheaper mode would be desirable; but silicates are certainly a desideratum, unless the professor has, in his present new manures, got over the difficulty.

It will, of course, be often said, as it has, indeed, been said, that this is not new. It will be useless to ask what is new, and what is not; as a system—as a whole, the connection between the vegetable and mineral kingdom has been so cleverly given, so many facts before doubted have not only been proved, but been shown to be necessary, that no one can look on it without admiring the artist, (if so we may term him,) by whomsoever and wheresoever the materials were collected; or, to use his own simile, he went into a cavern in which were a number of loose bones—he collected them, and formed thereby the perfect skeleton of a noble animal.

This may be said of a part of his work, and it may be said without fear, the original matter which he has brought forward is sufficient to make him careless as to small losses.

The principles of nutrition, as illustrated by him, are so beautiful, however unknown to many, and understood by still fewer, that it will not be out of place to give a short summary of some points. We see daily coming from the press such vigorous contradictions, in England chiefly by unscientific men, and in America by men at least pretending to science, that we know they are little understood. The analysis of albumen, casein, and gluten, are now known to have been made in the most accurate manner by Mulder, and others, and the composition of muscle is so well known, that we cannot hesitate in saying that the latter is formed from the former. They all contain a large proportion of nitrogen—no flesh can exist without nitrogen—be it the flesh of man or of beast, of fish or of fowl, nitrogen exists in it and in the same proportions. Now all our food must have nitrogen in it, else how could our flesh have it? We are continually giving out nitrogen from our bodies, and how can it be supplied again, but by a renewal of it in our food? It is a question too simple to require a lengthened explanation, now that the way is prepared for us, and the objections to it too trivial to require answering. In fact, it is now as well established as that food is at all necessary for us. No animal can feed on sugar, and live; can feed on starch or gum, and yet continue strong; these substances contain no flesh—they contain no albumen, which is the same thing. If a man says that he lives on sugar and water only, are we to believe him? certainly not. If he says that he becomes fat by eating sugar, we may believe him, because the elements of fat are found in sugar: but at the same time to support the other functions of the body, albumen, or a similar compound, must be taken along with it. Arrowroot, or starch, is sometimes taken, or rather was once taken, to support strength; but there is no readier mode of destroying strength than by giving for food a substance which does not contain the essential elements of muscle and of nerve, the organs without which strength cannot exist. True, children have been known to increase immensely in bulk by eating arrowroot only, but they have been

known also in the same period to lose both bodily and mental capacity, by the loss of brain and nerve, from a want of azotized matter in what they eat.

As nitrogen in the form of albumen, gluten, or casein must be eaten, and as these compounds are found in vegetables identically the same as in animals, except in their outward appearance, and as we know that there is no other form in which nitrogen can be obtained, we have a key by which we can find exactly how much of any given food is necessary to form a given quantity of flesh; at least we can tell the minimum, and can also tell the comparative value of different kinds of food. We can no longer dispute about the value of a potato, or say a given weight of potato is equal to the same weight of wheat; nor can we suppose that rice is equal to its weight of flour from wheat or of meal from oats. They are, no doubt, all valuable in their place, as all circumstances do not demand the same mode of treatment.

The analysis of the ashes of plants have furnished, also, an important lesson as to the capacities of soils. If a plant requiring a great deal of silica be put upon land containing little or none in a soluble state, the plant will, of course die, although the same ground may produce an abundant crop of potatoes, for example, which grow with little. The same may be said of lime, magnesia, soda, potash, although, more or less, they are always present. To give an idea of the variety in this respect, presented by the more common crops, a table is here added:

Silica Plants.	*Salts of Pot-ash and Soda.*	*Lime and Magnesia.*	*Silica.*
Oat-straw, with seeds	34.00	4.00	62.00
Wheat-straw	22	7.20	61.05
Barley-straw, with seeds	19	25.70	55.03
Rye-straw	18.65	16.52	63.89
Lime.			
Pea-straw	27.82	63.74	7.81
Potato, (herb)	4.20	59.40	36.40
Meadow clover	39.20	56	4.90
Potash.			
Turnips	81·60	18.40	
Beet-root	88	12	
Potatoes	85.81	14.19	
Sunflower	84.30	15.70	

To try to grow any of these plants on a soil void of potash, soda, lime, and magnesia, will of course be a fruitless occupation; but we may grow turnips and potatoes when we cannot grow corn. Corn requires a great deal of silica, especially for the straw, and a time of fallow is required in order that a certain portion should be made soluble by the atmosphere and other agencies. To carry out the deductions from these premises, is the business of the farmer; to establish the premises with respect to individual soils, is that of the chemist. It would be a great advantage to the Agriculturist to be able to obtain some idea of the nature of his soil by chemistry. A complete analysis is by no means necessary; a little practice would enable him to make many important observations as to the quantities of certain ingredients, without at any time using a balance, except in the first instance; that is in the amount of soil experimented on, which ought always to be the same. In this case the eye becomes experienced and its results in general are equal in value to the weighings of the balance It is true there are difficulties in the way, as even this small accomplishment is not, as we might suppose, easily obtained without some teaching. At least let us hope that the young will not grow old without it.

In looking at his works, we seem almost to have lost sight of the workman; and, if there be any test of greatness which will stand, it is this: to have done so much, and to have put so many in motion, that he himself need not guide the machine. To govern, the mind of the governor must be everywhere; with his sloth all is slothful, with his loss all is lost. But to teach men truth, and to make them understand, is to make what can reproduce itself, and form an endless series.

One of the most novel doctrines of Professor Liebig is that of poisons, contagions, and miasmata; and, however dark the subject now is, we may expect it to increase and multiply to a great extent. In such mysterious subjects, to make a theory with a foundation is a great deed; and the one alluded to explains so much, that it will no doubt be looked on by many as the most beautiful part of his work. It is remarkable that all the ideas which Dalton obtained on the state of atoms, in union and separation, were taken from the mechanical states of large bodies such as he could weigh and handle. His simple explanation seems now self evident; and we wonder that men should have thought otherwise; we wonder also that great men, such as Wollaston and Davy, should have doubted--should, in fact, have been unable properly to comprehend it for a long time. A law in mechanics has suggested a chemical action to Professor Liebig, which promises not much less than the theory of Dalton. "A molecule, set in motion by any power, can impart its own motion to another molecule with which it may be in contact." "We have seen that ferment or yeast is a body in a state of decomposition, the atoms of which, consequently, are in a state of motion or transposition. Yeast, placed in contact with sugar, communicates to the elements of that compound the same state, in consequence of which the constituents of the sugar arrange themselves into new and simpler forms—namely, into alcohol and carbonic acid.

"In these new compounds the elements are held together by stronger affinities than they were in the sugar, and therefore, under the conditions in which they were produced, farther decomposition is arrested. We know also that the elements of the sugar assume totally different arrangements, when the substances which excite their transposition are in a different state from the yeast just mentioned. Thus, when sugar is acted on by rennet, or putrifying vegetable juices, it is not converted into alcohol and carbonic acid, but into lactic acid, mannit, and gum, or into butyric acid."

Yeast is a product of the decomposition of gluten; it passes into a second stage, in contact with water, gives to the sugar an excitement to decompose, and, if any gluten be present, it causes it to undergo the first stage of decomposition, and to pass into yeast. These conditions are found in the fermentation of beer, and, whilst one portion of the gluten is disappearing, another portion is being produced from the gluten.

That a body in a state of decomposition can communicate to another body a similar state seems, from these and many similar facts, to be proved; or, in other words, that a body in chemical motion acts in an analogous manner on surrounding particles to a body in mechanical motion. We see that, in the action of the yeast, the force is not exhausted, as, if material be present, a second portion is formed which can, of course, do the same work, and the end can be

arrived at only by the finishing of the material. What is the cause of this he is not required to explain; but it is a fact; it is the case is a great range of facts; it may be safely taken as unity, and called a power, when we bring many other phenomena under this head, we have arrived at a great point. The action of contagion is, in all appearance, similar. Matter in a state of decomposition comes in contact with healthy matter, and decomposition begins; this increases, and may be infinitely increased: we saw that with the yeast the power of increasing increased with the progress. How otherwise can we explain the insidious agency of the plague, lurking as it does about organic matter until it has accumulated such force, or until it has excited decomposition in such a large mass as to cause it to assume the form of a decided disease, and continuing until the whole frame is attacked, until the brain can no longer act rationally, but in the violence of its decay converts reason into madness? The same of fever and of other contagious disorders.

Putrifying flesh causes plagues of various kinds by the same law; decaying matter, placed near sound flesh, begins rapid decomposition in it; putrid gases from sewers corrupt fresh meat which is placed near, and mould rapidly communicates mould. The case of mould may perhaps be otherwise explained.

The dairy which is not clean cannot preserve milk well, and the dirtiest farmers see, at least, the use of attending to the cleanness of the wooden vessels there. Milk decomposing will cause other milk to follow it; and any matter not in a sound state—coming, for example, from dung-heaps—into the apartment by the open windows, will be productive of much mischief.—The position of a dung-hill is not an unimportant matter in a farm, and a stagnant pool also ought to be in a position in which it will do little hurt. Some houses have them just between them and the direction of the prevailing winds. On these occasions it is often difficult for persons unaccustomed to it to sit long in the place. The prevailing wind ought to be known before building a house, and everything that promises a disagreeable odor put on the opposite side. Ponds, much superior in cleanness to those generally near farms, have been known to influence greatly the healing of sores from this very cause; and, we may make it a rule, because it is in fact a law of nature, that animal and vegetable matter in decay should be removed as far from us as possible, that we may be able to eat sound food and to breathe pure air.

It would scarcely be suitable to this work to give an account of all Liebig's writings; much, however, might be gained by a study of the work on Pathology, by studying the nutrition of animals, the production of butter and of fat, the effect of heat and of cold. The phenomena of motion and theory of disease are more allied to pure philosophy, and, interesting as the subjects are, they find little attention among practical men. As a short compendium of organic chemistry, popularly treated, no work will please general readers so well as the Chemical Letters of Liebig: there every subject which has engaged practical chemistry to a great extent is touched upon, and, without much study, some idea may be formed of its nature.

To have received opposition and not to fall by it, is another characteristic of strength; and certainly no views, at least of very late years, have received more opposition than those of Liebig's. We are not now in the scholastic ages, and a new idea seldom takes up more of our attention than a few hours—a discussion we expect to be able to read in a short time, and to have done with it—nor could we find sufficient, in any public dispute whatever, to take us a journey of some hundred miles, even in an easy railway carriage. The opposition, especially in the French periodicals, has been great, although the London ones are certainly not to be left out.

It remains for us now to look a little more closely to the person whose life we are considering. Giesen, where he resides, is a small town, containing about 8.000 inhabitants; the population chiefly lives on learning, at least, almost all the respectable class are either judges, lawyers, professors, teachers, or students; and, as the students amount to 400, and the teachers to an almost equal number, we thereby nearly account for the whole male population of maturer years. This is certainly saying too much, but, at any rate, few towns of the size can boast of so many men of superior education. True it is, that many of our luxuries and conveniences are absent, but again the want of a market for surplus produce makes many very accessible, which to us are very expensive; and, if we may judge from the appearance of the people on Sundays and holidays, none are happier, and we should be obliged to go back to the days of merry old England before we could find such a group of happy English workmen. This is said merely to give persons some idea of what the place (of which no one seems to know anything) actually is. It has assumed the dress of peace, by substituting an avenue in place of a wall round the town, and several castles in the distance—skeletons of combative systems now gone by—tell us that it once was compelled either to suffer or to resist oppression. The rising ground near the town is now growing into a new, better-built, and better-situated town; and we doubt not that, where the cause of contagion has been so well taught, means will be taken to give every house a due supply of that light, heat, air, and cleanliness in general which our towns cannot always obtain, from the numbers of the population, and the expense of land, &c.

The university has flourished greatly, as Liebig has flourished, and the number of students working in his own laboratory amounts to about fifty; whilst a number attend the laboratory of Dr. Will, his former assistant. This is, then, the largest chemical school in the world, and it is richly endowed by the government. The smaller States of Germany seem to believe what in other places seems merely a problem not yet solved, that the education of a man is of the first importance, and that house and lands rank second, not first.

Of the honors gained by Liebig we all know a little, we know of his late visit to us in autumn, when he received as much attention as a country could give him; especially in Scotland. His own country has not forgotten him however; Austria and Prussia have both endeavored to obtain his services, and not succeeding there in spite of the most tempting offers, they have been content to honor him. His own government has made him Knight of the Hessian Order, and Russia, Knight of the Order of St. Ann: it need scarcely be added, that he is a member also of many societies. It may be well perhaps to finish this sketch by a quotation from Professor Gregory of Edinburgh, who is himself a phrenologist, and who introduced Liebig to the

principal phrenologists in Edinburgh, where his head was examined carefully. The great powers of observation are the first to strike us on looking at the head, and give a breadth over the eyes, extending as far as the ears, which we seldom see. Of particular organs I shall not speak.

"It may be interesting," says Professor Gregory, "to many of our readers to know that Professor Liebig is in person tall and well formed. His complexion is dark, his countenance is handsome, and in the highest degree animated and expressive. His cerebral development has been carefully examined by the Edinburgh phrenologists: it is of the very highest class, the intellectual and moral regions greatly predominating. Perhaps Europe does not contain a larger anterior lobe of the brain than Liebig's; and this, with his active and energetic temperament, point him out as one born to take a lead in science, and to give a new direction to the age. As a man, he is no less amiable than distinguished as a philosopher."

It is scarcely proper speaking of a living man to say much of his domestic life: to say he is married, or to speak of his children is more properly for a future time.

It may be that those who read this sketch will suppose that it is not sufficiently laudatory. It is unnecessary to praise any man, let us only tell what he has done, and the feeling of praise rises in every mind; here something of what he has done in Agriculture has been mentioned; if it has been clearly stated, those who see its value will not fail to give due credit to the man.

EXTRACT OF A LETTER FROM A GENTLEMAN IN THE SOUTH—*The sort of information needed there, with suggestions for Agricultural writers.*

——, Aug. 27, 1845.

Dear Sir—* * * As your work is large, I hope you will find room for articles particularly applicable to Southern Agriculture. All information about cotton and corn is, of course, valuable to us. Indigo and tobacco, particularly Spanish, are again attracting our attention.—Muck and marl are two hobbies with me, and to these, together with draining and making manure, I devote one-third of my effective force, *the year round.* I have been doing so for three years, and have just arrived at the point of making more with the other two-thirds than I did formerly with all. I hope to *pass it* very far in time, besides vastly increasing the value of my land.

We are very ignorant here of the labor-saving machines at the North. They have many in established use that we know nothing of. A list and description of all invented within 20 years, and in successful operation, with their prices, and where they may be had, would be very valuable. Indeed, a series of articles, stating and illustrating all the changes and improvements in Agriculture for 20 years, would be highly acceptable here. The old plan, the new plan, and the advantages of the change, would give us very important *truth.*

I wish you could reform agricultural writers in one important particular. They state their experiments in such a loose way that one can seldom try them. A man, you know, might describe a one-dollar bill and a ten-dollar bill from the same bank, very minutely, to his own satisfaction; yet, if he left out the trivial circumstance of the 0, we should not know that one bill was ten times as valuable as the other. We want quantities in bushels—distances in yards—areas in acres—in short, the length, breadth, depth, weight, measure, time, &c. &c. of every thing, minutely, accurately, and in terms understood every where. It is not only useless, but provoking, to read nine-tenths of the articles intended to enlighten agricultural readers.

From the American Farmer.

TO PREVENT SMUT IN WHEAT.

Since our own directions upon this important matter were written, we have received the annexed note from Hon. Wm. Carmichael, whose authority with us is equal to that of any agriculturist of our State:

SUCCESSFUL EXPERIMENT TO PREVENT SMUT IN WHEAT.

To the Editor of the American Farmer:

In the 3d vol. of the Farmers' Register, page 743, there is an account of a series of experiments made by M. M. de Bombasle, for preserving Wheat from the Smut, one of which he found entirely successful; and, perhaps, some benefit may be derived from an account of the advantage I have derived from its application. I recommend to you to subjoin that article, as it may give confidence to my experience.

Smut was brought on my farm by changing my seed Wheat, and though it never extended so far as to produce very serious injury, I was very anxious to expel it; and, in the year 1843, I used the means in the article I have referred to, according to the manner therein directed.—At the next harvest, I found the Smut much diminished, but some still remained. Last Fall I used the same means, under a different application. I dissolved, in a large tub, 18 lbs. glauber salts in 22 gallons of water. The Wheat was thrown into it well-washed, and so much of the solution as was not taken up was drawn off for farther application; the Wheat was then put into a bed of quick-lime (slaked immediately before being used) on my barn floor, well stirred so as to produce adhesion to each grain, and then spread to dry.

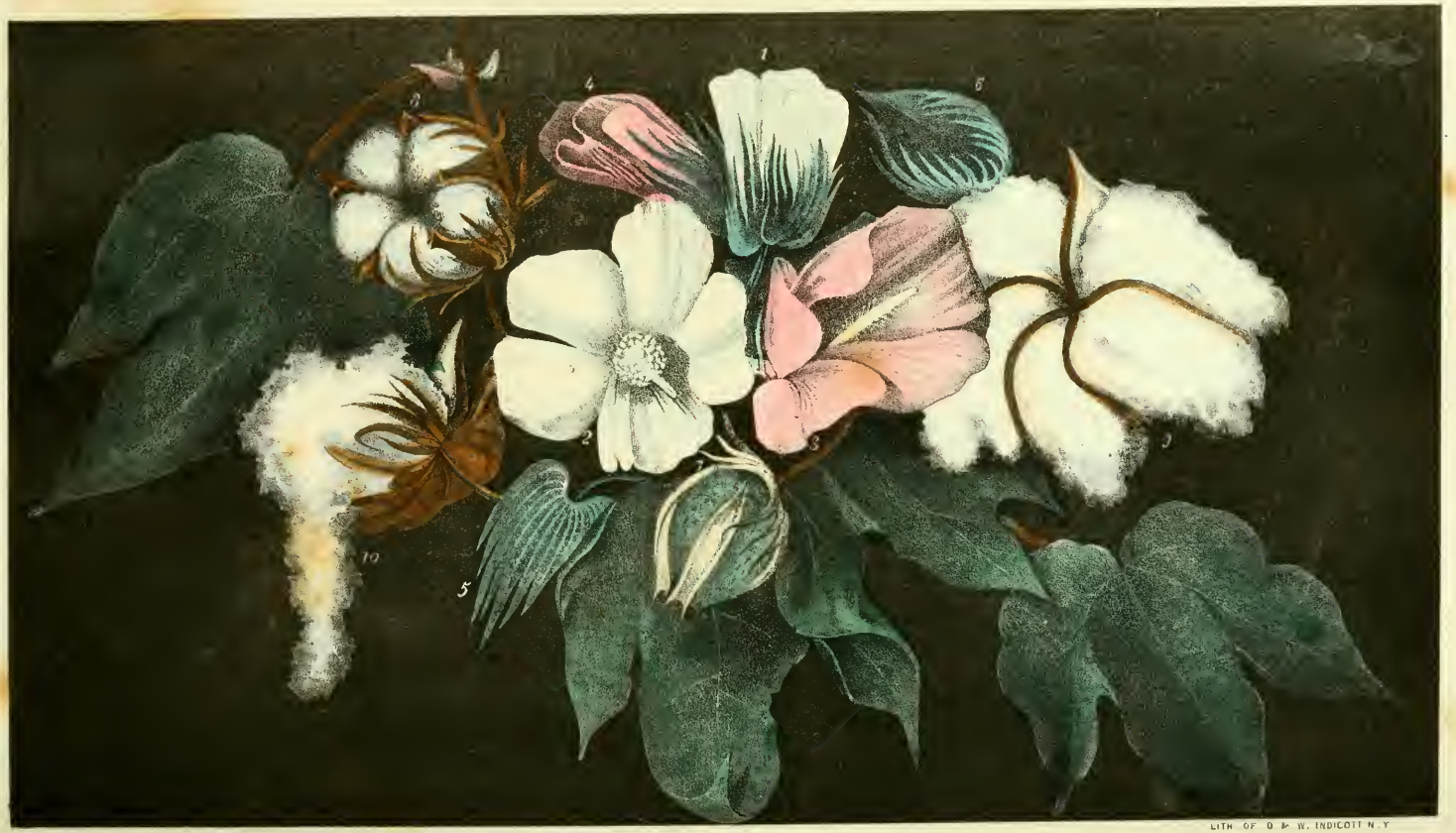
I have lately finished threshing. I have examined the Wheat and have not detected a Smut-ball. This is also the experience of my overseer and my most observant laborers.

I do not know that the germinating power would be injured if it remained unsown for many days under the lime; but to avoid the hazard, I have permitted the Wheat thus prepared not more than three days unsown.

My neighbor, Mr. Wm. De Coursey, to whom I communicated the experiments of Mr. Bombasle, made one with common salt, by which the Smut was much diminished, but some still remained. My experiment with glauber salts has resulted in entire success.

WM. CARMICHAEL.

Wye, Queen Ann's Co., E. S. Md.



LITH. OF D. & W. INDICOTT N. Y.

THE COTTON PLANT.

1. The blossom. 2. The flower. 3. The same flower. Second day. 4. The same flower at night. 5. The "burr," or involucre. 6. The young boll. 7. The boll bursting. 8. The boll nearly ripe. 9. The boll ripe, cotton perfect. 10. The cotton blown by the wind.

THE COTTON PLANT....ITS HISTORY AND USES.

It would have been better that the plate of the Cotton-Plant, which embellished the September number of the Farmers' Library, should have been accompanied with the following very interesting and learned essay on the origin, cultivation and uses of Cotton, by the distinguished President of the South Carolina Agricultural Society; but that whole number was in type before we found ourselves obliged to substitute that plate for another which had been prepared.

This essay serves, in its way, to illustrate one leading feature in the design of the Farmers' Library, which is, not only to instruct the young Farmer in all the practical details of his pursuit, but to improve and liberalize his mind, and to qualify him, as a man of varied information, to hold his proper rank in society. To do this, it is indispensable that he should make himself familiar with the natural history and uses, not only of the plants that he cultivates and the animals that he rears, but with all the objects that belong to the country, and that naturally become subjects of inquiry and of conversation among country gentlemen of any pretensions to intelligence and scholarship. All this knowledge may be gained, and all this intellectual respectability and enjoyment be secured, during hours of leisure which are now, by many of them, spent in a manner worse than unprofitable, at country taverns, or in scenes of low and vulgar excitement and dissipation; or they may be secured in hours of confinement at home, which, for want of books, or the love of books, (to be begotten in early life,) are whiled away in listless ennui.

What Mr. Seabrook has done to enlighten us as to the history and uses of a plant which forms one of the great staples of the country, shall, in time, be done for every tree of the orchard and the forest—every grain of the field and every vegetable of the garden. Every vine shall tell its own history, and every bird shall sing its own song, until, in place of the sneer of ignorance at the suggestion of *rural literature!* he who reads, and properly appreciates his position, shall be forced to ask himself—Where do the literary studies and researches that properly belong to rural life end? What do they not embrace of all that is worthy of being known?—until, in a word, speaking in the fullness of his heart, he shall say:

"And this our life, exempt from public haunt,
Finds tongues in trees, books in the running brooks,
Sermons in stones, and good in every thing."

We could, for the present, ask no better exemplification of our views than is presented in the following:

A MEMOIR ON THE ORIGIN, CULTIVATION AND USES OF COTTON, from the earliest ages to the present time, with especial reference to the Sea-Island Cotton-Plant, including the improvements in its cultivation, and the preparation of the Wool, &c. in Georgia and South Carolina: Read before the Agricultural Society of St. John's Colleton, November 13th, 1843, and the State Agricultural Society of South Carolina, December 6th, 1843. By WHITEMARSH B. SEABROOK, President of the State Agricultural Society of South-Carolina.

COTTON,* from the Arabic word Kotôn, is the spontaneous production of all the intertropical regions. Of the four great materials designed by Providence for human clothing, it is believed that none was assigned to Europe. To Asia was given all—Cotton, flax,† the sheep,‡ and silk worm;§ and to Africa and America, Cotton and flax. It is remarkable, too, that of these, the one which was obviously designed to be the most extensively useful, was the last to be generally diffused. For many centuries the growth and manufacture of Cotton were confined exclusively to India. The total silence of the Hebrew writers, and the very slight notices to be found in Greek and Roman‖ literature concerning the wool-bearing shrub,** are to be ascribed to the utter unacquaintance of the nations bordering on the Mediterranean with the populous coun-

* German *Kattunwölle, Baumwölle;* Dutch, *Kétoen, Boomwol;* Danish, *Bomald;* Swedish, *Bomull;* Italian, *Cotone, Bombagia;* Spanish, *Algodon;* Portuguese, *Algodno, Algodeiro;* Russian, *Chlobts-chataza bumaga;* Polish, *Bawelna;* Georgian, *Bomby, Bamba;* Latin, *Gossypium;* Greek, *Bombyx Ylon;* Mongul, *Kobung;* Hindoo, *Rúhi;* Malay, *Kapas;* Indian, *Kopa;* Chinese, *Cay-Haung, Hoa-Mien.*—Skinner, the etymologist, says that Cotton is so called from its similitude to the down which adheres to the quince, *malis cydoniis,* which the Italians call *cotogni,* and *cotogni* manifestly *a cydonis.*

Gossypium, or Cotton, a genius of the polyandria order, belonging to the monodelphia class of plants; and in the natural method of ranking under the 37th order Columnifera.

[*Encyclopadia Britannia, vol.* 8. *p.* 21.

† Flax is indigenous in Egypt, and also in America.

[*Clavigero's Mexico,* pp. 25, 26.

‡ The sheep, (Ovis,) the Argali of Siberia. This animal inhabits the mountains of all Asia, and becomes as large as a fallow deer. It is from the Moufion, or the Argali, that we are supposed to derive the numerous races of our woolly animals, which next to the dog, seem most subject to vary.

[*Cuvier's Animal Kingdom, vol. 4th,* pp. 26, 27.

§ Silk was first made in China. Silk worms, with the art of manufacturing their produce, were brought from China to Constantinople by two Persian monks, in the reign of Justinian, A. D 552.

‖ Virgil, in the second Georgic, clearly alludes to the Cotton Plant in the following lines:—"Shall I sing of the groves of Ethiopia, hoary with soft wool; and how the Seres," (a people of India,) "comb out the delicate fleece from among the leaves?"

** From its resemblance to the fleece of the sheep, the first material probably made into cloth, it was called the "wool of trees" In the markets of the world, it is designated "cotton wool."

tries beyond the Indus. Even after a considerable traffic had grown up between Rome and the East, Cotton, as a textile material, excited no particular interest nor more than a passing remark by the scientific inquirer. In the omission also of the writers of the middle ages to mention cotton stuffs, while enumerating the vestments in common use, it is to be inferred that woolen, linen, and silk, of which they continually speak, then constituted the customary wear of the people. We learn from Nearchus, Alexander's Admiral, who (327 B. C.) descended the Indus, that "the Indians wore garments, the substance whereof they were made growing upon trees; and this," he says, "is indeed flax, or rather *something much whiter and finer than flax.*" Herodotus, (445 B. C.) the father of history, evidently supposed that the Cotton Plant was limited solely to India. "The inhabitants of that country," he states, "made their clothes of the product of a certain plant, which, instead of fruit, produces wool, of a finer and better quality than that of sheep."

On the authority of Strabo, who was cotemporary with our Saviour, Cotton grew in the Persian province of Susiana. We are informed by Pliny, who lived about A. D. 75, that in the earliest ages, when Cotton fabrics were worn only by the Indians, the dress of the Babylonians was of linen and wool, and of the Egyptians, linen.* It was not until the Christian era that the introduction of the Cotton Plant into the country of the latter took place.† "In Upper Egypt towards Arabia," he says, "there grows a shrub called gossypium, by others xylon, from which the stuffs are made that we call xylina. It is small, and bears a fruit resembling the filbert, within which is a downy wool, which is spun into thread. There is nothing to be preferred to these stuffs for whiteness or softness; beautiful garments are made from them for the Priests of Egypt." The same writer enumerates, among the productions of the Island of Tylos, in the Persian Gulf, "wool-bearing trees that bear a fruit like a gourd, and of the size of a quince, which, bursting when it is ripe, displays a ball of downy wool, from which are made costly garments of a fabric resembling linen." It is probable, remarks a late writer, as the soil of Arabia is unadapted to the raising of flax, and the climate too hot for the fine fleece of sheep, that Cotton was applied to clothing purposes in the infancy of the human race. It is certain, however, that at the time of the Hegira, A. D. 622, cotton cloth was a common material of dress. The next authentic account of the Cotton Plant is derived from Marco Polo, who visited many countries of Asia as the confidential agent of the Tartar conqueror of China. He saw Cotton growing abundantly in Mosul, opposite the ancient Nineveh, in Persia, and at Guzzerat, in which latter place it was produced from a tree "six yards high, which bore twenty years." After the time of the Venetian traveler, but before the 14th century, the evidence is satisfactory, that the wool of the gossypium was the staple manufacture of Arabia, Persia, and all the Provinces on the Indus. Notwithstanding the proximity of China to India, and the commercial intercourse between them, it was not until the 11th century that the herbaceous Cotton, which four hundred years before had been raised in gardens for the beauty of its flowers, was grown for domestic use. So slow was its progress among the industrious and skillful people of that Empire, then distinguished for their knowledge of the arts,* that two centuries elapsed before it constituted one of the staple crops of the country. China is now an importer of the wool. About 70 years ago, the lands cultivated in Cotton, in consequence of the alarming scarcity of provisions, were appropriated to the raising of corn by command of the supreme authority.

Although Cotton is indigenous in Africa, and grows luxuriantly and plentifully, especially in its central and western parts, yet there are strong reasons for concluding that the knowledge of its husbandry was spread among the people of that Continent, north of the Equator, by the early followers of Mohammed. No authentic notices of the progress of its tillage exist until the 15th century, when it was not only extensively grown, but the fleece was manufactured, by the Caffres, by the Moors at Cefala, by the inhabitants of the coast of Guinea, and along nearly the whole northern shores of the Mediterranean.

Spain was the first nation in Europe that cultivated the Cotton Plant, and manufactured clothing from its produce. Both occurred in the 10th century. The Moors who were mingled with the Arabs at the Spanish conquest, says De Marlés, brought with them the husbandry of rice and Cotton, of the mulberry tree and the sugar cane. In the year 1050, the Priests of San Adveno were authorized to let their church lands for its cultivation. Soon afterwards it appeared in Italy, particularly along the shores of the Gulf of Taranto. It was then gradually extended to Greece and the adjacent countries. In the 16th century it was produced in the vicinity of Hyeres, and elsewhere in the southern parts of France.

Columbus, Magellan, Drake, Cavendish, Dampier, Van Noort, and indeed all the earlier voyagers, with one exception, concur in representing that, in the decoration of their persons, or where, from the coldness of the climate, some covering to the body was necessary, the aborigines of the Western Continent, among other materials, used Cotton. Several of them, moreover, saw "Cotton growing wild and in great abundance" in the West India Islands and on the Continent. The Patagonians tied up their hair with "Cotton Lace," and so plentiful was the vegetable wool in Brazil, that the inhabitants made their beds of it. In St. Salvador, where Columbus first landed, the Spaniards, who describe the women as dressed in short "Cotton coats," exchanged caps, beads, and other toys for "Cotton yarn." On this Island Cotton was seen "growing of itself." In the fabrication of Cotton and other cloths, the Mexicans displayed so much ingenuity and neatness, as to create a

* The microscopic examinations of Lewenhoeck conclusively show that the mummy cloth of Egypt was composed entirely of linen.

† The cultivation of Cotton had long been discontinued in Egypt, when Mehemet Ali, about the year 1823, renewed the enterprise with a spirit indicative of a vigorous and sagacious mind. The first year, 60 bags were produced; in 1836, as high as 180,391 bags were exported to Europe. Of late years the quantity grown has been inconsiderable, and as the culture of the crop depends on the capricious determination of the Pacha, no judgment can be formed of the future supplies from that country. (See Tables 3 and 4 in the Appendix.)

* The Chinese were the original manufacturers of silk, paper, and sugar. They, too, first practised the art of printing, and were the first acquainted with the properties of the magnet, and the composition of gunpowder.

doubt in the minds of their conquerors, whether the European artists could surpass or even equal them in that branch of industry. Among the presents sent to Charles V. by Cortes, were Cotton cloths of exquisite fabric, dyed in various colors. Even as far north as the Mes-chacebe, or Mississippi, the earlier explorers of that river and its tributary streams, saw "Cotton growing wild in the codd and in great plenty."* These facts, and they might be almost indefinitely multiplied, are introduced to rebut the opinion, founded on the negative testimony of Capt. Cook, that the gossypium is not a native of the Western Hemisphere. That celebrated voyager found no Cotton between New-Zealand, 36° South, and the Sandwich Islands, 20° North. In addition to flax and the bark of the mulberry tree, in which Capt. Cook says the inhabitants of those regions were habited, the natives nearly all over the continent certainly used, as articles of dress, besides Cotton, feathers, the wool of rabbits, the maguei, a fibrous plant, and silk grass.

The gossypium was cultivated by the Dutch in Surinam in 1733. The precise time of its existence, as a staple commodity, in the West-Indies is uncertain, though it probably occurred early in the 17th century. The presumption is against its having been the produce of Hispaniola as early as 1562, as William Hawkins, the Englishman, who carried to that Island a cargo of negro slaves, the first ever brought to the Western world, received in exchange for them only, "pearls, hides, sugar and ginger." From a few of the tables of exports, to which alone on this head access has been had, it appears that, in 1726, Cotton was one of the staple crops of Hispaniola,† and that, in 1753, Jamaica exported 2000 bags, and, in 1768, to Great Britain and Ireland, 2211 bags of 200 pounds weight, and to North America 252‡ bags On an average of eight years, from 1740 to 1748, among the exports of Barbadoes 600 bags of Cotton are included. In 1787, the Islands of St. Domingo,§ St. Christopher, Grenada, Dominica, Antigua, Montserrat and Nevis, and the Virgin Islands, were exporters of this commodity. Before 1803, in which year Jamaica did not grow one bag for exportation, there were five varieties of gossypium planted in the West-Indies, viz: the common Jamaica, the brown-bearded, the nankeen, the French or small seed, and the kidney or Brazil Cotton.‖ The interest on capital in the raising of the lowest priced Cotton in the British West-India Islands in 1785, '86 and '87, was 14 per cent.,** but in St. Domingo, where finer Cotton was produced, applying the same calculations, it was 24 per cent.††

The materials for obtaining a correct knowledge of the ancient general history of Cotton are so meagre that the short account just concluded embraces substantially all that is known on this interesting subject.

Of the two kinds cultivated in the United States, the green seed or short staple Cotton* is derived from the Herbaceum or herbaceous Cotton, and the Hirsutum or hairy American Cotton; the long staple or black seed Cotton† is derived from the Arboreum or tree Cotton. The former was certainly grown in Virginia, in a limited way, at least one hundred and thirty years before the Revolution. Several of the early Governors of that Colony used diligent efforts to secure the fabrication of certain articles, which, it was believed, it could profitably raise; and the introduction and culture of new crops, among which was Cotton; but their designs were thwarted, as well by the unjust and tyrannous conduct of the mother country, as by the opposition of the tillers of the soil, who, in a matter so important to themselves, had the boldness to consult what they held to be their true interests. Sir William Berkley, his Deputy, Francis Morrison, and Sir Edmund Andros, were particularly prominent in not only advising the people to diversify the products of the field, but to engage in the manufacture of hemp, flax, salt and potash.‡ Resolved to make a commercial profit of the plantations, Cromwell, by his celebrated navigation act, prohibited them from receiving or exporting any European commodities, but what should be carried to them by Englishmen or English built ships. They were absolutely forbid corresponding with any nation or colony not subject to the crown of England. The restraints proving ineffectual, another act in the reign of Charles II. was passed, by which the Colonies could have no foreign goods, which were not first landed in England, and carried directly thence to the plantations. As the effect of these edicts was to raise the value of European goods, and depress that of tobacco, several abortive attempts were made by the Assembly of Virginia to prevent the planting of that crop for one year, and during that time to invite the people to turn their thoughts to manufactures, and the cultivation of other crops, Cotton included. Land being abundant, and obtainable on easy terms, and the belief prevailing that the mother country would soon remove all unnecessary restrictions on trade, and promote in a more certain and permanent form the culture of tobacco, they pertinaciously refused to divert their new capital into a new channel, and saw no necessity for adopting the last recommendation of the local government.

* A description of the English Province of Carolina, by the Spaniards called Florida, and by the French, La Louisiana, by Dan. Coxe, pp. 81, 82.

† Burke's Account of the European Settlements in America, p. 15.

‡ Edwards' West-Indies, vol i. p. 257.

§ On an average of the years 1787, '88 and '89, the exports of Cotton from the French part of St. Domingo, were 6,698,858 lbs.

‖ The first import of Cotton into England from the Brazils, was in 1781.

** Edwards' West-Indies, vol. iii. p. 95. This large interest was the result of the prices, viz: 1s. 3d. sterling per pound, and not the production, which averaged only about 100 lbs. per acre.

†† *Ibid.* The price of the Cotton wool of St. Domingo was 2s. per lb.

* It should be called, says Dr. Ure, *fruticosum*, shrubby, because its stem is woody and not herbaceous. It is distinguished from the other species of gossypium by having the five lobes of its leaves rounded and terminated with a sharp point. Its capsule is three or five-celled; each cell contains about five seeds of an ash color. The stems, which increase in hardness and size with the heat of the climate, are somewhat reddish near their lower part, velvety or hairy towards the top, and variegated with black points. The branches are short; the leaves green, soft, pretty large, and divided into five short lobes. The axillary peduncles towards the extremity of the boughs end in a large beautiful yellow flower; the three leaflets of the flore, or cup, are large, and deeply-toothed on their edges. [*Ure, pp.* 63, 64.

† Calyx cup-shaped, obtusely five-toothed; inclosed in a three-cleft exterior calyx; the leaflets united at their base, of a heart-shape and toothed; stigmas three to five; capsule three to five-celled, and many seeded; seeds bearing a downy wool. [*Ure, p.* 60.

‡ History of Virginia, by a native and inhabitant of the place; published in 1722,—pp. 50, 90, 92.

The "paternal command" of Charles I. that the planters should make no more than 100 lbs. of tobacco per man, on the ground that he could not afford to give them above 3s. the pound for it, they had affectionately resisted so far as the obstacles in their way permitted them: it was not, therefore, to be supposed that they would now curtail their field labors in relation to their favorite product, the foreign demand for which was annually increasing. When, however, necessity constrained them to try the expedient of fabricating cloth, other than hemp and flax, for family use, strong opposition was quickly manifested. Francis Nicholson, Governor of Virginia, in 1698 "recommended to Parliament to pass an act forbidding the plantations to make their own clothing; in other words, that the planters shall go naked."* In reference to Carolina, the conduct of the Colonial authorities to the planters was perhaps unexceptionable. From physical causes, their labor, it was foreseen, could never come in competition with that of Britain. From the inaptitude of Europeans for the labor requisite in such a climate, and more especially for the crops suitable to the soil of an uncleared and heavily-timbered country, added to the utter ignorance of many of the emigrants in the art of Agriculture, and the unacquaintance of all with the productions most likely to reward their labor, the early settlers, though living in a higher latitude, continued to cultivate the same crops in Carolina that they had done in England; and thus, by exhausting their strength in fruitless struggles, continued poor, whilst the best lands were procurable at the rate of one thousand acres for twenty pounds sterling. Insensibly, however, they engaged in that department of husbandry, which, while it required little exposure and personal strength, served to supply England and the West-Indies with such articles as they respectively needed, in exchange for what the Colony was unable to produce.† The raising of silk was introduced into the country by Sir Nathaniel Johnson about the year 1703. The mulberry being an indigenous tree, and the great demand for silk in England, concurred to render this an encouraging branch of industry. In 1759, 10,000 lbs. of raw silk were produced in this State.‡ The growing of rice§ followed the business of making tar, pitch and turpentine, that had long been one of the principal employments of the land-owners. To this, about forty years afterwards, was added indigo,* which was soon extensively grown in certain locations, where it continued to be the sole staple commodity until the tobacco culture began to be attended to. Although the climate and soil were experimentally known to be well adapted to the Cotton Plant, yet, as before the introduction of negroes, other crops had employed the time of the planters, when that event occurred, rice proved to be so lucrative a business that, from 1703, it engrossed their whole strength and attention.

In the infancy of the Colony, the advice of the Trustees of Georgia to the planters to cultivate the vine and mulberry to make wine and silk, because "in work of that light kind, poor women and children might be usefully and advantageously employed," was generally unheeded. Like their more northern neighbors, they obeyed the dictates of their own will, in the belief that their sagacity would soon discover the shortest way of arriving at the goal of their desire. They continued, therefore, in the vocation of growing rice and indigo, and providing naval stores for the West India and English trade until the breaking out of hostilities with the mother country. In that year, while a Cotton patch was no unusual spectacle, Col. Delagall, of South Carolina, who had joined Gen. Oglethorpe, as Lieut. Delagall, cultivated thirty acres of the green seed kind, near Savannah.

In a pamphlet of the date of 1666, entitled "A Brief Description of the Province of Carolina, on the Coast of Florida," the writer, in speaking of the Cape Fear settlements, made only two years before, says they have "indigo, tobacco, very good, and *Cotton wool*." Dr. Hewitt, in his historical account of South-Carolina and Georgia, while commenting on the introduction of silk into the former, and the products of the earth for which premiums ought then to have been given to those who should bring to market the greatest quantities of them, alludes particularly to Cotton, and, after detailing the manner of planting it, remarks that this article, "though not of importance enough to have occupied the whole attention of the Colonists, might, nevertheless, in conjunction with other staples, have been rendered profitable and useful."† In Wilson's account of the "Province of Carolina in America," published in 1682, it is stated that Cotton of the Cyprus and Malta sort grows well, and a good plenty of the seed is sent thither."‡ In Peter Purry's description of the Province of

* Idem, p. 92.

† To Great Britain were exported furs, deer skins, rosin, tar, pitch, and raw silk, in exchange for woolen, cotton and silk goods, arms, ammunition, and agricultural implements; to the West-Indies, beef, pork, butter, candles, soap, tallow, myrtle wax candles, pitch and tar, cedar and pine boards, shingles, hoops, staves, and heads for barrels, in return for rum, molasses, sugar, Cotton, chocolate made up, and cocoa-nuts.

‡ To a very rich satin damask, now in the possession of Mrs. F. Rutledge of Charleston, the following memorandum is affixed:—"In 1753, Mrs. Pinckney [see page 177] took with her to England a quantity of silk spun from worms of her own raising at Belmont, near Charleston. It was considered by the manufacturers equal to any imported from Italy. The quantity was sufficient to be woven into three dress patterns; one of which Mrs. Pinckney presented to the Princess Dowager of Wales, mother of George III.; another to Lord Chesterfield, the third she brought back to America."

§ A bag of rice was given to Landgrave Smith, in 1695, by the Captain of a Brigantine from Madagascar, that touched at Charleston on her way to Britain. The Governor divided the rice between Stephen Bull, Joseph Woodward, and some other friends, who planted their small parcels in different soils.—[*Hewitt's Historical Account of South-Carolina and Georgia.*

* In 1741 or '42, George Lucas, Governor of Antigua, sent to his daughter Eliza, afterwards Mrs. Pinckney, the distinguished lady previously alluded to, some seed, as an experiment. From its produce was made the first indigo that was grown in South-Carolina. In 1745, this plant was discovered growing spontaneously in the woods. Two years afterwards, a large quantity of indigo (from imported seed principally) was sent to England, which induced the merchants trading to Carolina to petition Parliament for a bounty on Carolina indigo.—*Hewitt.* The East is indebted to the Western continent for this plant. The high bounties of the British Government, assisted by the knowledge of a Mr. Gray, once the overseer of John Powman of Charleston, who carried to Bengal the American mode of manufacturing the produce, extended its growth in India.

† Carroll's Historical Collections of South-Carolina, vol. i. p. 141.

‡ Idem, vol. ii. p. 84

Carolina, drawn up in Charleston, in 1731, "flax and Cotton" are said to "thrive admirably."*—On the journal of Mrs. Pinckney, the mother of Gen. Thomas and Gen. Charles C. Pinckney,† —who, as Miss Lucas, when only eighteen years of age, was entrusted with the management of the planting interest of her father, the Governor of Antigua—is the following memorandum:—"July 1, 1739—Wrote to my father, to-day, a very long letter on his plantation affairs—on the pains I had taken to bring the indigo, ginger, *Cotton*, lucerne and casada to perfection, and that I had greater hopes from the indigo than any other." "June, 1741—Wrote again to my father on the subject of indigo and *Cotton*." It is a well-authenticated fact that, in 1736, as far north as the 39th degree, Cotton on "the garden scale" was raised in the vicinity of Easton, in the County of Talbot, on the Eastern Shore of the Chesapeake Bay.‡ About forty years afterwards, it was cultivated in St. Mary's County, Maryland, and in the northern County of Cape May, in New-Jersey; also in the County of Sussex, in Delaware. Mr. Jefferson, in his Notes on Virginia, written in 1781, says:—"During this time we have manufactured within our families the most necessary articles of clothing. Those of Cotton will bear some comparison with the same kinds of manufacture in Europe; but those of flax, hemp and wool are very coarse, unsightly and unpleasant." A short time before the Revolution, a few of our planters, by growing patches of Cotton, some of which was of the black seed kind, succeeded in clothing not only their families, to which they had been accustomed, but also their slaves. The necessities of the War, and the state of things existing for some time after it, greatly increased the number of the domestic fabricators of the wool, until about the year 1790, when the practice of using homespun for plantation purposes became very common in the districts and upper parishes.—The yarn was spun at home, and sent to the nearest weaver. Among the manufacturing establishments, the one in the vicinity of Murray's ferry in Williamsburg, owned by Irish settlers, supplied the adjacent country. The Cotton for the spinning process was prepared in general by the field laborers, who, in addition to their ordinary work, picked the seed from the wool, at the rate of 4 lbs. per week.

At the Convention at Annapolis, in 1786, Mr. Madison, in a conversation with Tench Coxe, concerning the Cotton husbandry, remarked that, "from the garden practice in Talbot, and the circumstances of the same kind abounding in Virginia, there was no reason to doubt that the United States would one day become a great Cotton-producing country." The evidence then existing on this subject—especially the interesting fact that, during our struggle for Independence, Philadelphia had been furnished with native Cotton, worth two shillings sterling per pound, enough for the limited home consumption; and the information communicated to Gen. Thomas Proctor, of that city, by Richard Leake, of Georgia—removed all doubt in reference to the practicability of raising the gossypium, as a crop, on a large extent of the Atlantic coast.—This conviction of the public mind soon insensibly led to the belief that the United States could also card and spin its fleece, and, probably, weave it by water power. The result was a mission to Great Britain, at the expense of Tench Coxe, to obtain the machinery, and all the information which it was important the parties should possess. The influence of a manufacturing society, established in Philadelphia in 1787, and the prevalent opinion that the raw material might be made a profitable source of revenue, induced Congress, at the first reformation of the Tariff, to impose a duty of three cents a pound on foreign Cottons,* with which the United States were at that time supplied from the West Indies and the Brazils.

That, in 1792, the growth of Cotton in this country was unknown to Mr. Jay, or that, as a commercial article, it was deemed of little value, is obvious from the fact that, in the treaty negotiated by him, it was stipulated that no Cotton should be imported from America; the object of that diplomatist being to secure to the English the carriage of the West India Cotton to its market in Europe. This is the reason why the Senate refused to ratify the 12th article of that treaty. In half a century how wonderful has been the revolution effected in the Cotton husbandry of the United States! In 1792, the entire crop was 138,328 lbs.; in 1842, 785,221,800 lbs. were produced.† The first Provincial Congress in this State, held in January, 1775, recommended to the inhabitants to plant Cotton, but their recommendation was almost entirely disregarded. The whole quantity of that commodity, prior to 1795, exported from the United States was inconsiderable, but in that year it amounted to 6,276,300 lbs.‡ of this, the proportion contributed by South-Carolina was 1,109,653 lbs.§

Among the exports of "Charles-Town" from November, 1747, to November, 1748, are included 7 bags of Cotton wool, valued at £3 11s. 5d. per bag.‖ In 1754, "some Cotton" was again exported from South Carolina.** In 1770, there were shipped to Liverpool, three bales from New-York, four bales from Virginia and Maryland, and three barrels from North-Carolina.†† Before the Revolutionary War, Virginia exported, *communibus annis*, hemp, flaxseed, and *Cotton*, to the value of $8,000. In 1784, an American vessel that carried eight bags to Liv-

* Idem, vol. ii. p. 133. Peter Purry was a native of Switzerland, and the founder of Purrysburg. In the reign of George I. he presented a memorial to the Duke of Newcastle, then Secretary of State, in which he sets out with this postulate, that "there is a certain latitude on our globe, so happily tempered between the extremes of heat and cold, as to be more peculiarly adapted than any other for certain rich productions of the earth," among which he enumerates silk, *Cotton*, indigo, &c.; and he fixes on the latitude of 33°, whether North or South, as the identical one for that peculiar character.

[*Rees's Encyclopædia, vol.* x.—*Article Cotton.*

† See Notes, p. 176.

‡ American Farmer, vol. ii. p. 67.

* Niles's Register, vol. xxxii. p. 332.

† Of the imports of Cotton into Europe from North America, Egypt, South America, the East and West Indies, in 1842, amounting, in the aggregate to 2,924,463 bales, this country furnished 2,379,460 bales, or more than three-fourths. (See note A and table 4 in the Appendix.)

‡ The year 1795 includes some foreign Cotton in the export.

§ In Ramsay's History of North Carolina, the amount exported is erroneously valued at "1,109,653 pounds sterling."

‖ American Husbandry, containing an account of the soil, climate, productions and agriculture of the British Colonies in North America and the West Indies: published in London in 1775. Vol. i., p. 437.

** Drayton's Memoirs of South-Carolina.

†† Smither's Liverpool, p. 155.

erpool, was seized, on the ground that *so much Cotton could not be the produce of the United States.** In 1785, 14 bags; in 1786, 6 bags; in 1787, 109 bags; in 1788, 389 bags; in 1789, 842 bags; and in 1790, 81 bags were received in Europe from this country;† of these, 153 bags were sent directly, and a portion of the remainder by the way of Philadelphia and New-York, from Charleston.‡ The first bag of Cotton sold in South-Carolina, was purchased in 1784, by John Teasdale, from Brian Cape, then a factor in Charleston. The first bag of the wool exported from that city to Liverpool, arrived January 20th, 1785, per Diana, and was consigned to Messrs. J. & J. Teasdale & Co.§ The exports from 1790, though very much mixed up with foreign Cottons, slowly but steadily increased until 1794, when a powerful impetus was given to the Cotton culture by the invention of the saw gin by Eli Whitney, of Massachusetts.‖ This ingenious but unfortunate artist, who by his machine doubled the wealth and means of employment of his countrymen, and thereby in an especial manner conferred on the Plantation States a benefit that can scarcely be estimated in money,** was rewarded by South-Carolina, North-Carolina and Tennessee only. The first appropriated $50,000 for the use of his invention within her limits; the second laid a tax for five years of 2s. 6*d.* upon every saw in every gin that was mounted within its jurisdiction; and the last imposed a tax of 37½ cents upon every saw, to be continued for four years. Notwithstanding these liberal legislative acts, the inventor derived no pecuniary benefit from his gin. He expended the whole amount received from South-Carolina (from the other States he received a mere pittance) in defending himself against arbitrary and vexatious suits, and in prosecutions for violations of his patent right. Over the grave of this distinguished benefactor of the human race, a monument is erected, with this simple but expressive inscription—"The Inventor of the saw-gin."

It was not the design of the writer to speak particularly of the culture of green seed Cotton, as a crop, in South-Carolina, but having gathered a few interesting facts concerning this great staple, he deems it his duty to present them to the Society. The history of this and the black seed Cottons is, indeed, intimately blended.—The growing of the former in this country for exportation was begun but a few years before that of the latter;†† the same machine for extracting the seed from the wool was for a long while employed; and the modes of cultivation and preparation, with one exception,‡‡ including the manner of packing the bag, were also the same.

As a preliminary point, it may be asked, whence came the seed of this Cotton, now so extensively cultivated in the United States?—This question is probably not susceptible of a positive and unexceptionable answer. That it was not brought from India is perhaps obvious. The policy of the East India Company, who obtained their monopoly in the year 1600, was unquestionably adverse to the exportation of Cotton seed. Indeed, the wool itself was not first exported by them. This was done by the privileged merchants in 1798. Individuals would scarcely have deemed it necessary to draw from the distant East that which was obtainable much nearer home, and of a quality, too, greatly to be preferred. As the trade in the raw material during the larger portion of the periods alluded to, was confined to the Mediterranean, it is a legitimate inference, in the absence of positive proof, that, from that quarter, the nations of Europe, owning possessions in the Western hemisphere, respectively introduced into them the new culture. This, perhaps, was especially true of the Low Countries and of England, as in 1560, the former constituted the dépôt of Cotton goods from the Levant; and the Turkish trade, of which Smyrna was the seat, was, at the time of which we speak, the most important to the latter. Peter Purry is represented to have brought with him, among other seeds, that of Cotton. This, and a paper of the same material, received by the Trustees for the settlement of Georgia, from Philip Miller, of Chelsea, England, it can scarcely be questioned, were from the Mediterranean. Mr. Wilson, already quoted, says expressly, that the Carolina sort was from Cyprus and Malta. In a pamphlet entitled "American Husbandry," published in London, in 1775, the writer remarks, that "the Cotton cultivated in our Colonies is of the Turkey kind." On the other hand, it must be supposed, from the language of their historian, that the Cape Fear emigrants, who began the growing of the gossypium only two years after they had established their settlements, were provided with seed from Barbadoes. The vicinity of the West Indies; the profitableness of the Cotton crop; and the varieties of the plant, which, at an early period were cultivated in those Islands—all render it nearly certain, that from thence was drawn a portion of the supply with which the people were from time to time provided.

Between 1786 and 1795, Cotton from various parts of the world was introduced into the Southern States and Louisiana. A species of the white Siam was for some time the subject of experiment by the French in the latter country. The Nankeen came from Malta. The Bourbon was brought from that Island to Charleston, through the instrumentality of James Hamilton, who was a merchant, and part owner of the only India ship at that time trading beyond the Cape of Good Hope. The Pernambu-

* Smither's Liverpool.

† See note B. in the Appendix.

‡ Of the 14 bags exported to Liverpool in 1785, ten of that number were shipped from Charleston by John Teasdale. So short was the crop of 1789, that the high prices alone induced the planters to continue the cultivation of Cotton.

§ Smither's Liverpool—Note B.

‖ Mr. Miller, of Georgia, in whose house he lived at the time of the invention, was associated with Whitney in his labors. The letters patent bear date, October 28th, 1793.

** "If we should assert," said Judge William Johnson, "that the benefits of this invention exceed $100,000,000, we can prove the assertion by correct calculation."

†† In Georgia, the long staple cotton was first planted for market; in Virginia, South-Carolina and North-Carolina, the short staple Cotton.

‡‡ The bow-string operation. A large bow, made elastic by a complication of strings, is put in contact with a heap of Cotton; the workman strikes the string with a heavy wooden mallet, and its vibrations upon the knots of the Cotton shake it from the dust and dirt, and raise it to a downy fleece. The bow, says Mr. Baines, in his history of the Cotton Manufacture of Great Britain, has been used immemorially throughout all the countries of Asia, and has its appropriate name in the Arabic and other languages. In this country, he remarks, it was first employed in Georgia; hence the term, still applied in commerce, "Bowed Georgia Cotton."

co or kidney Cotton, was sent from the Havana to Mr. Levett, of Georgia, by a Mr. Welch, a merchant of Philadelphia. These, and many other sorts, after a fair trial, were abandoned, for the reason of their inferiority to the kinds then profitably raised, viz:—the real green seed, and the Sea Island Cotton; the latter having superseded the plant that was grown at the period of the Revolution, which strongly resembled the short staple in growth and blossom, except having a clean black seed with fur at the end. The Louisiana Cotton, it is thought, was derived from this species, but degenerated in the progress of tillage by intermixture with other kinds. To a cross with Sea-Island Cotton, large quantities of which were shipped to Louisiana immediately subsequent to its cession to the United States, is perhaps in part to be attributed the decided superiority of the New-Orleans Cotton wool of the present day over all others in North America of the green seed description.

From this brief notice of the quarters whence different Cottons were received in this country, in connection with the progress of the plant from beyond the Indus to the Levant, we have satisfactory reasons for concluding, that to the Mediterranean and Asia Minor we are mainly indebted for the particular species of the gossypium which has been the subject of investigation. Of the two kinds from which the green is derived, the Herbaceum is clearly of Eastern origin, and the Hirsutum also probably, though it is positively asserted to be a native of the West Indies.

Notwithstanding in the accounts current, published in the "Carolina Gazette" of 1792, the article of Cotton does not appear, yet, it is certain, that even at a much earlier date, it was vended in Charleston in small parcels, varying from one to thirty pounds. In 1787, it was brought from Orangeburg, Newberry, and, it is believed, Union, and sold in the seed to the merchants, at two pence per pound, who resold it principally to the ladies to make "patch-work bed-quilts." In that year, or the following, two or three bags, about 100 lbs. each, of seed Cotton, were packed in the store of Wadsworth & Turpin by Samuel Maverick* and Jeffrey, a half-blood Indian. These were shipped to England as a sample and an experiment. The answer of the consignees was discouraging. It is not worth producing, said they, as it cannot be separated from the seed. In 1794, Dr. James Otis Prentiss, and in the same or subsequent year, Col. William Thomson, of Revolutionary memory, each planted Cotton for market; the former in Orangeburg District, within a mile of the village, and the latter at Bellville, in St. Matthew's Parish. In 1796, cultivators of the crop appeared in several parts of the State; among them were Samuel Felder, of Orangeburg. It was first grown in the High Hills of Santee by John Mayrant and Asbury Sylvester, in 1798. The year afterwards, Gen. Wade Hampton introduced the plant into Richland District. With the energy and sagacity that distinguished him, he began his operations on an extensive scale, and from 600 acres he gathered over 600 bags. Although not the first person who employed Whitney's Cotton-gin* in South-Carolina, (for, in 1795, one was erected on Mill Creek, five miles below Monticello, Fairfield, by Capt. James Kincaid, and, three years afterwards, by several other planters,) still he was certainly the first who used water as the propelling power. His gins were furnished by an ingenious artist of Georgia, assisted by William Munson, of Richland. Though of rough construction, they served as models for others made in 1801, by William Munson and James Boatwright, of Columbia. These were the first of the new machines of home manufacture. It does not appear that Cotton was raised for market in Edgefield, and the more northern districts, until 1802, until which time tobacco was one of the staple commodities. In that year, Col. Z. S. Brooks erected a Cotton-gin on the North or Saluda side of the district. With this he prepared for sale the crops of his neighbors for the compass around him of ten miles.

Before concluding this branch of our inquiry, it becomes necessary to remove a difficulty that seemingly militates against what has been advanced in reference to the exportation of Cotton from South-Carolina. On the highest authority, it has been already stated that, from 1785 to 1790, a period of six years, there were shipped from Charleston 153 bags of Cotton; yet, from the representations just made, it seems that that commodity was not grown, as a crop, in this State until 1794. The solution is probably this: the Cotton was either prepared by hand-roller gins, which were undoubtedly in use even before the war, and sold in small quantities to the merchants, who packed it for exportation: or it was sent in the seed to Philadelphia and New-York, there to undergo the cleaning process.—The latter supposition is based on the large amount† of Cotton shipped from those ports in the years alluded to, and the fact, as will be seen hereafter, that machines to disconnect the seed from the wool were employed in Philadelphia, in 1784. Farther, the condemnation of the bags subsequently exported by Wadsworth & Turpin, shows that the previous consignments must have been of clean Cotton, and not in the seed as might be conjectured.

Sea-Island, or black seed Cotton, began to be raised in Georgia, in experimental quantities, in 1786. The native place of the seed is believed to be Persia. It is designated the Persian Cotton by Bryan Edwards,‡ and is so called in the West Indies and by the merchants of England. The seed grown in this country came from the Bahama Islands, where it had been introduced by the Board of Trade from Anguilla, a small Island in the Caribbean Sea, and was sent by Mr. Tatnall, then Surveyor-General of the Bahamas, Col. Kelsell, and others, to Governor

* Mr. Maverick states that he was the first person who made sugar in South-Carolina. About the year 1800, he planted some ribbon cane, purchased in the Havana, in his lot to the East of the present Orphan House. it yielded 300 lbs. The cane was pounded in a mortar, and the juice boiled in iron pots.

* "When Whitney's gin was exhibited in Georgia, none but women were permitted to enter the room. An ingenious young mechanic at length introduced himself into the apartment in women's apparel, and, by a minute examination of the machine, satisfied himself that he could not only imitate, but improve on its construction, by making it more efficient.—This discovery was communicated to my father by Gen. Gun, who spoke so confidently of the capacity of this individual, that my father was induced to visit him at his residence in Georgia. This visit resulted in a contract for three gins, applicable to a large scale of operations, and they were unquestionably the first ever driven by water-power."—[*Extract of a letter from Col. Wade Hampton to the writer.*

† See note B. in the Appendix.

‡ Edwards' West Indies, vol iv. p. 363

Tatnall, James Spalding, Richard Leake, and Alexander Bisset—all of Georgia. Its first cultivators in that State were Josiah Tatnall, Nicholas Turnbull, James Spalding, and Richard Leake. The first bag exported from Georgia was by Alexander Bisset, of St. Simon's Island, in the year 1788, or, in the opinion of some, by a Mr. Miller, who for that reason still bears the name of "Cotton Miller." The Bahama seed did not give fruit the first year, but from the mildness of the winter of 1786, seed was obtained from the rattoon, and the plant became acclimated.*

The black seed Cotton region of this State is bounded on the North and north-west by a line about 20 miles South of the line that separates Barnwell and Orangeburg from the neighboring parishes; on the north-east and East by the Santee river;† on the West and south-west by the Savannah river, and on the South and south-east by the Ocean. The Eutaw Springs, in St. John's Berkley, is the extreme northern point to which it extends. Williamsburg was, for many years, embraced in its limits; but that district no longer furnishes a supply of the raw material. About the year 1812, three or four planters, as an experiment, introduced its culture into the southern part of Sumter district. The quantity and quality of the crops were sufficiently encouraging, but, as the preparation of the wool was objectionable, the growers abandoned their enterprise for the reason of the large expenditure of labor and time that it required.—The first attempt in South-Carolina to raise a crop of long Cotton was made, in 1788, by Mrs. Kinsey Burden, of Burden's Island, St. Paul's Parish. As early as about the year 1779, this and the short staple Cottons were produced by her husband, whose negroes were then clad in homespun of home manufacture. Although Mrs. Burden's field, the larger portion of which was in corn, was manured with compost, the plants did not begin to bloom until September, and not a pod ripened. The cause of failure was subsequently traced to the seed, which was of the Bourbon kind.‡ The first successful crop appears to have been grown by William Elliot, deceased, on Hilton Head, near Beaufort, in 1790, with 5½ bushels of seed, purchased in Charleston at the rate of 14*s.* per bushel.§ The Cotton brought 10½*d.* per pound. In 1791, John Screven, of St. Luke's Parish planted 30 or 40 acres at his Montpelier plantation on May river. The product was packed in the article called *Hessians*, and sold, in Georgia, to Mr. Troup, Robert Bolton, and Mr. Miller, for 1*s.* 2*d.* to 1*s.* 6*d.* sterling per pound. In 1792, John Rose cultivated a small field on the Oakatee creek, from which he gathered 600 lbs. which commanded, in the Savannah market, 2*s.* a pound. It is certain that, at this period, many planters on the Sea-Islands, and contiguous main land, experimented with long Cotton, and, probably, it was produced by several of them for market. The season of 1793 found cultivators in other sections of the State engaged in the good work; among them James King of St. Paul's Parish, Col. Edward Barnwell and Capt. John Joyner of Port Royal, and Gen. William Moultrie of St. John's Berkley. The crop of Mr. King yielded abundantly, and was sold by Kinsey Burden, now of St. John's Colleton, at 12*d.* to 13*d.* the pound; that of the latter, at his Northampton plantation, covering a field of 150 acres, was a decided failure—the result of an unacquaintance with the proper mode of management, in connection, probably, with an unfavorable season. In attempting to raise so new a product on so large a scale, and thereby encountering the hazard of sacrificing the labor of a year, Gen. Moultrie gave a signal proof of his devotion to the true interests of South-Carolina. He had gallantly defended her in war; in peace he was still her ardent friend, diligently seeking opportunities to nourish and sustain her. But to return from this digression. The Cotton culture from this time progressed rapidly. In all the Parishes the practical friends to its extension greatly multiplied. Against each other this plant and indigo struggled for the ascendency. In 1798,* the latter had very generally ceased to be grown for market.

As an evidence of the former value of this species of the gossypium, and of the success of some of its growers, it is worthy of record that Peter Gaillard, of St. John's Berkley, in 1799, averaged 78 pounds sterling per hand. In that year, James Sinkler, of the same Parish, from a field of 300 acres, realized 216 lbs. per acre, for most of which he received 3*s.* a pound. William Brisbane, deceased, at his White Point plantation, St. Paul's Parish, was so successful in 1796, '97, and '98, that, from moderate circumstances, he became, in his judgment, so independent as no longer to engage in the toilsome task of cultivating the earth. He sold his landed estate to William Seabrook, of Edisto Island, at a price held by many to be ruinous to the latter,† and passed a few years in traveling in our Northern States and in Europe.‡

While the larger portion of the seed used in

* These interesting facts, except what is said of Mr. Miller, rest on the authority of Thomas Spalding, of Sapelo Island, Georgia:

"While lately at Savannah, Mr. Scott brought to see me a very respectable gentleman from the Bahamas, a merchant, but also the Speaker of their Colonial Assembly; who stated he had been applied to from Louisiana the last winter to procure five bushels of Cotton seed, and strange, what had been England's best Cotton colony a few years back, did not afford this small supply—the gentleman could not procure a seed; and what did the Negroes live upon, I asked? Upon Sago, made from the Conti plant, which was growing in the woods, and which they had been taught to prepare, no doubt, from some of the Indian Negroes from Florida—many of whom had taken shelter in the Bahamas. What a lesson upon English legislation for her colonies!"—[*Extract of a letter from Thomas Spalding, of Georgia, to the writer.*

† West of that line some green Cotton is also grown.

‡ All attempts to naturalize the Bourbon Cotton, though it strongly resembles the green seed species, have failed.

§ The original paper, "An account current between William Elliot and Jacob Deveaux," showing the purchase of the seed in 1789, was kindly put into the hands of the writer by William Elliot, Esq. of Beaufort. As Cotton seed was for sale in that year, other planters, it is probable, cultivated it as a crop in '90, but their names are unknown.

* At that early period, the opinion prevailed that the supply of Cotton would soon exceed the demand. A highly respectable planter of St. John's Colleton, deceased, in looking at his first crop, the produce of a few acres, after it had been housed, exclaimed—"Well, well, I am done with the cultivation of Cotton! Here is enough to make *stockings* for all the people in America."

† Mr. Seabrook, with the proceeds of the crops of the plantation, paid the purchase-money in two years.

‡ It is questionable whether the Sea-Island planter, for the last five years, has realized over 5 per cent. on his capital.

South Carolina was either purchased in Charleston or in Georgia, a considerable quantity was obtained in the Bahamas, through the active exertions of friends who resided in Providence.

In 1780, when England had no fine manufactories, the best Cottons brought to her market were from the Dutch plantations of Berbice, Demarara and Surinam. These then commanded respectively 2*s.* 1*d.*, 1*s.* 11*d.*, to 2*s.* 1*d.*, 2*s.** In 1786, Bourbon Cotton,† remarkable for fineness, but deficient in length, was worth from 7*s.* 6*d.* to 10*s.* per pound. It was superseded by Sea-Islands, which in '99 sold readily in Liverpool at 5*s.* to 5*s.* 3*d.*‡ per pound. Its price in this State, in the infancy of its production, was generally from 9*d.* to 1*s.* It soon rose to 1*s.* 4*d.* and 1*s.* 6*d.*—then to 2*s.* and upwards,§ at which it remained until 1806, when the planter for the first time experienced the baneful effect of restrictions on commerce. From the superiority of this Cotton to that raised in any other country, even from the same seed, the staple at first was objected to, as too long, and by one or two English spinners, it is said, it was actually cut shorter.*

* Edwards's West Indies, vol. iii. p. 92.
† Bourbon Cotton was first imported into Manchester in 1783.
‡ Smither's Liverpool. p. 157.
§ From 1798 to 1809, both inclusive, a distinguished planter of this State sold his Cotton in Charleston at the following prices:

	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
1798....	1						
1799....	1 4						
1800....	2	2 1					
1801....	2 1	2	1 8				
1802....	2 3	2 1	2 4	2 7	2	1 8½	1 7½
1803....	1 8½	1 9	1 8	1 7	1 6	2 6	
1804....	1 6	2 6					
1805....	2	1	1 9	1 6½			
1806....	1 11	1 9	1 7				
1807....	1 8	1 7	1	25c.	18c.	13c.	10c.
1808....	30c.	25c.	23c.	15c.			
1809....	26c.						

* Smither's Liverpool, p. 135.

[*To be continued in next number.*]

THE CENTRAL OR RED-LAND DISTRICT OF VIRGINIA.

ITS SOIL AND ADVANTAGES DESCRIBED.

We might vouch, if voucher were needed, for the accuracy of the following sketch from the pen of Hon. W. L. Goggin, who so well and faithfully represented that District in the last Congress.

The field, however, for eligible investment, for men who have small capital in money, but a better sort of capital in skill, and industry, and economy, is not confined to any particular District of the Old Dominion. We verily believe that the world does not afford a more inviting field for the exercise of these manly virtues, than does that entire and vast region, whose head springs find their way through a thousand creeks and rivers into the Chesapeake Bay

Where are such sheep-walks, such inexhaustible beds of lime, of coal, and of iron to be found, as in the mountains of Maryland and Virginia? And then descending to tide water, where such long and deep rivers, such growth of wood and timber, such beds of marl and of oysters? Much as is thought and said of the profit of capital employed in manufactures, it is nothing compared with what might be realized by a company with *large* capital skillfully engaged and directed, in the purchase of wood and timber lands, with their marl-beds and oyster-flats, on the tide-water counties of both those States. Half a million of New-England working-men would rapidly grow rich on their waste lands and unused resources.

There are hundreds of fine estates that might be bought, a great part of the purchase money on time, the wood and timber of which would pay for them three times over, with adequate capital, managed with tolerable discretion, in preparing and sending them to the markets of Baltimore, Philadelphia, New-York and Boston; all of which are easily and cheaply accessible.

Washington City, Jan. 20, 1845.

J. S. Skinner, Esq.

Your former connexion with the American Farmer had made your name familiar to most of us of Virginia, and we are pleased to find you again wielding your pen in another quarter. The allusions you make to the soil, the resources and the natural advantages of the Old Dominion, are as just as they are well-timed. I trust that many of your New-York readers may be led to look for themselves into the truth of what you have said. Let them come among us, of all parts of that Old Commonwealth, as they have already done into the neighboring county of Fairfax, and we promise to show them an abundance of the finest lands, which may be bought at reduced prices,—a country than which none can be more beautiful, more healthful, with better advantages of water-power for transportation or machinery, with a soil originally more productive or susceptible of a higher state of improvement. As you are desirous "to collect all practicable information concerning the condition and price of lands, in the regions men-

tioned, and all other information which the friends of improvement may choose to communicate for the purpose of extending a knowledge of the advantages presented for settlers, as to the number, extent, soil, condition, price and products of estates for sale, including the names of the owners or occupants, with particulars concerning the proximity to water courses and mineral manures—the advantages for sheep husbandry, and grazing generally, as well as for grain growing," &c.—I have hastily made a few reflections which I give you, as respects my District, which is commonly known as the *Central or Red Land District of Virginia*—embracing the counties of Bedford, Amherst, Nelson, Albemarle, Orange, Madison and Greene.

BEDFORD, the county in which I reside, is bounded on the south side by the *Staunton River*, a branch of the Roanoke, on the north by the *James River*, while its western extremity, the whole length, reaches the top of the *Blue Ridge* adjoining the rich valley counties of Roanoke and Botetourt. It is accessible by water communication on both sides, and has many advantages for transportation, which are not surpassed by those of any midland county in the State. The *James River and Kanawha Canal* will pass, when completed, through its entire northern border, and it is now completed to the town of *Lynchburg*, very near the Bedford line, thus opening a speedy communication with the tide-water at Richmond, 150 miles below. Lynchburg is a rich, flourishing town, with a population of some six or eight thousand and is the market for the entire county of Bedford. It has some 50 or 60 stores, a *Cotton Factory*, fine *Flour Mills*, a number of *Tobacco Factories*, *Iron Foundry*, &c., with many other manufactories, and immense water power which is supplied from the *canal* and *water-works*.

The *Peaks of Otter* are situated in this county, (Bedford,) on the North-west corner—they are not only beautiful themselves, when seen as they are in the distance, but the whole range of the *Blue Ridge*, presents, perhaps here, the most interesting view of the kind in the State. These mountains afford an unlimited range for stock, and the advantages for *sheep walks*, (mild as is the climate, combined with the productiveness of the soil,) that are nowhere equaled, as is believed, except by similar situations in the neighboring counties. The county seat is the village of Liberty, in full view of the mountains, at some 12 miles distance; it has a population of from five to seven hundred, and is located on the great western road from the lower James River country to Nashville, Knoxville, and all the South-west. The Lynchburg and Salem Turnpike passes through it. It is a neat and thrifty village, with a fine Court-house, four churches: Baptist, Methodist, Presbyterian, and Episcopalian; it has also an Academy for young ladies, now under the charge of most experienced and popular teachers.

The soil of the county generally is of the rich red and chocolate-colored clays. No land can be better adapted to the growth of clover, and all the grasses, which are produced in the greatest perfection, aided as they are by *Gypsum*, which is procured at Lynchburg, the market near us, at a comparatively trifling cost, by *Lime*, which can be had in abundance within a few miles, at various places in the county, and by animal and artificial manures, which are easily produced. This county now is in a rapid state of improvement and in a few years will become to be second to none in the State in point of actual fertility. Less tobacco is now produced than formerly, and as this crop has been gradually given up systematic farming is advancing. The grain crops produced are corn, oats, wheat and rye; potatoes, beets, turnips, peas, &c. are also produced in the greatest perfection, with but little labor. Fifty bushels of corn and thirty bushels of wheat are often gathered, on the best improved farms, and any of the good lands can be made to produce 100 bushels of corn to the acre. The prices of lands vary according to locality from $3 to $25 per acre; hundreds of acres may be had of most excellent quality at from $5 to $12. Where it lies near the turnpike, or in the vicinity of the village, more will be asked. Ranges for sheep may be had at very reduced prices on the mountains, and where, too, could be produced all the grasses in which they delight, such as the red and white clover, the meadow fox-tail, short blue meadow grass, lucerne, rye grass, &c. These advantages, and then the beautiful clear streams which abound in all the mountain regions, invite a pastoral life, and the shepherds with their flocks are only wanting to fill out the picture in Dyer's Fleece.

"First, however,
Drive to the double fold upon the brim
Of a clear river, gently drive the flock,
And plunge them, one by one, into the flood.
Plunged in the flood not long the struggler sinks
With his white flakes that glisten through the tide;
The sturdy rustic in the middle wave
Awaits to seize him rising; one arm bears
His lifted head above the limpid stream.
While the full clammy fleece the other laves
Around, laborious with repeated toil;
And then resigns him to the sunny bank,
Where bleating loud he shakes his dripping locks."

What is said of the soil of Bedford may apply to almost the entire district, all the counties of which lie stretching in a line, from the base to the summit of the *Blue Ridge*, except the county of Orange, which is intercepted by the county of Greene, of which it once formed a part. AMHERST is immediately North-east of Bedford, on the James River, and has all the

advantages of its navigation as well as the market of Lynchburg. Its soil, as well as that of NELSON county, still to the eastward, is admirably adapted to the growth of all the crops I have named. Both of these counties have immense natural water-power facilities. Their mountain streams, if properly applied, would be sufficient to propel the machinery of the whole Union. The ranges for stock here, too, are extensive, and the beautiful rich mountain sides interspersed with farm-houses, some of them even elegant mansions, betoken an independence among the inhabitants that is often found in such situations. Many of the mountains to their very summits are covered with the richest verdure, not "*eternal snows*," like those of *Oregon*, as described by travelers. The James River Canal affords an outlet for the products of these counties as well as those of the county of *Albemarle*, which has also the advantage of the navigation of the *Rivanna River*. Boats ascend this river above the town of Charlottesville, near which is *Monticello*, the seat of Mr. Jefferson, as well as the *University* of the State. Charlottesville is a place of considerable size, with the finest society, and the highly cultivated lands in its neighborhood remind many Virginians more of a number of large, rich gardens, than the farms to which they are accustomed. Agriculture here has been long pursued systematically, and I believe this county can boast of one of the very oldest Agricultural Societies in the State. Some of its more distinguished sons are still the friends of the Society, and, among others, Dr. FRANK CARR, Hon. WM. C. RIVES and THOS. J. RANDOLPH, Esq. deserve to be remembered by the patrons of Agriculture, for their efficiency and zeal. Lands in this county rate higher generally than in some of the other counties, and it has facilities in the way of roads, rivers, colleges, &c. that no counties East or West of the mountains can lay claim to. There are in the county two Cotton Factories, employing a number of hands.

The county of ORANGE, the residence of the late Governor BARBOUR, and of his brother the Judge, lies on the waters of the *Rappahannock*. Its market is Fredericksburg and Richmond. The court-house is not far distant from Gordonsville, at which point the *Louisa Railroad* terminates, and which intersects with the Richmond, Fredericksburg and Potomac Railroad. The land of this county is very productive in all the crops that are grown successfully in Eastern Virginia. Lying, as it does, off the spurrs of the mountains, and gently undulating, it is tilled with less labor than many of our high lands. Near as it is to the town of Fredericksburg, it has all the advantages of a tide-water country, while it is remarkably free from diseases.

The counties of MADISON and GREENE, adjoining those of Rockingham and Page on the West side of the Blue Ridge, in the Valley, abound in lands resembling those of the other counties already named. Many of the farms are in the highest state of improvement, and those upon the *Robinson* and *Rapid Ann* rivers, and the smaller streams, are not surpassed by the best farms of the other counties. Wheat, corn, oats, tobacco, and other crops, are cultivated most successfully. Here, too, are abundant ranges, and the wonder is that sheep-husbandry is not introduced. These counties are watered by streams which flow into the Rappahannock and supply the water-power for numerous flouring-mills on an extensive scale.—The town of Fredericksburg, on this river, is distant some 50 miles, up to which the river is navigable for steamboats, and where, also, the Richmond, Fredericksburg and Potomac Railroad crosses, terminating in a northerly direction, on the Potomac River. The facilities for travel, North or South, as well as for the transportation of produce, are, therefore, very great. Good lands in all the counties named are abundant and cheap; they hold out inducements to settlers and promise advantages that, in many respects, are unequaled.

I might give you particulars in regard to many farms within my knowledge, but time will not allow me to do so. There are many that may be purchased on such terms as cannot fail to suit those inclined to make such investments. In the county of Bedford, in the neighborhood in which I reside, there is one containing 7 or 800 acres, that may be purchased on a credit (and it may be divided into some three, four, or more farms) of one, two and three years, the purchase money being well secured, at $10 per acre. It is well watered on one entire side by a stream perhaps three times as large as the Tyber in this city. There are many of the finest springs in various parts of the land, and it is intersected by numerous small streams, called, in Eastern Virginia, branches.

I have thus endeavored to give you an outline of some of the features of our country; but, hastily written as it is, it is very imperfect. I trust your efforts to call public attention to the lands of Virginia will not be without a good effect.—Every portion of the Old Commonwealth is deserving of the efforts which a few are making to place her in the scale she is entitled, by her position and her advantages, to occupy.

I am, very respectfully,
W. L. GOGGIN.

GUANO.—This is said, in the "Florists' Journal," to have killed all the plants in pots to which it was applied dry, mixed with the soil at the time of potting. But, would it have injured them had it been made into a compost three months before the time of potting, and exposed to the weather all the time?
{*London Gardeners' Chronicle.*

A MISCELLANEOUS CHAPTER.

SOILING—VARIOUS OPINIONS....STRAWBERRY....A NEW VEGETABLE....LIQUID MANURE.

We are aware that there is much question about the expediency of attempting to *soil* domestic animals in this country. The question is one about which, as Sir Roger de Coverly says, much may be said on both sides. What, it is maintained, renders it unprofitable in most cases, is the *dearness of labor*. In the one case, the food is to be provided by laborious and expensive cultivation, and then to be cut daily and transported to the barn-yard or stable. This is what constitutes the objection to soiling, as compared with the usual system, under which the same animals depend on natural pasturage, and are themselves the machines for collecting the food, and turning it into milk, or butter, or meat; or, if work-animals, they to are thus supported during their season of labor.

Mr. Gowen, widely known as a zealous merchant agriculturist, of Philadelphia, has practised extensively on the soiling system, as the means of accumulating great masses of manure, by which his farm has been brought into a state of great productiveness from one of great sterility: but there would seem to be, in his statements, a want of exactness and minute detail, under the heads of *Creditor* and *Debtor*, with which, in his character as an eminent merchant, we have no doubt he is perfectly familiar, and of which he is rigidly observant. This apparent want of arithmetical particularity, as to outlay and income, leaves an opening for suspicion and cavil on the part of those who are ever ready to pick a hole in the statement of results achieved by full-handed merchants, when they betake themselves, for profit or amusement, to practical Agriculture. Such Doctor Doubtys will not, for instance, be slow to surmise that in healing over the galded spots upon his farm, as he found it, and causing them to put forth heavy crops, he probably walked over his fields, with the wand of Midas in his hand, waving it here and there, and scattering gold dust, where the poor Farmer has to spread any thing he can scrape together, and water it with the sweat of his brow. Hence the necessity of being very particular in stating such accounts. The accounts of English agricultural experiments are generally exemplary in this respect.

As to soiling, we remember to have heard read before the Farmers' Club, a letter from John Travers, Esq., a gentleman of singular quickness of parts, and remarkable for power and habits of analysis, in which he maintained that soiling, in this country, even under favorable circumstances, involved expenses that no ordinary results would remunerate. As we before said, much may be said on both sides; and the advantages of soiling are, in most cases, so decided, especially in its instrumentality in augmenting the *Bank of Manure*—the indispensable Bank for the Farmer—that we shall at all times feel bound to suggest whatever may have a tendency to remove the difficulties that stand in the way of its more extended practice. One of these difficulties consists in finding suitable grasses and other green crops, adapted to keeping up an abundant, cheap and unbroken supply of the different kinds of food, suitable for animals to be housed or yarded throughout the year. Grasses are to be preferred to roots because their cultivation and gathering requires so much less labor; but then they can only be availed of from early Spring until, at the farthest, the early frosts of Autumn. As to the *grasses*, we have been accustomed to think that in our country, we have relied too exclusively on *red clover*—and restriction almost exclusively to that, results, we verily believe, from the greater ease with which it may be secured, and from that disreputable indolence (the force of habit and defective education) which prevents farmers from *thinking*, and from breaking away from old prejudices. We have repeatedly suggested a fair trial of *lucerne*, and of our ordinary rye; and in the last number of the Farmers' Library, we called attention to a new species of rye, much extolled in England lately for soiling purposes, called there the *St. John's-day Rye*. It will occur to every reader that things may possess great comparative value in England, and thus become subjects of high praise and commendation in English papers because they have nothing better; and yet these same crops lose in this country, by comparison with others which are of more value, but which are unknown in England. The turnip, for instance, which may be said to lie at the bottom of British husbandry, sustaining indirectly her population and her government, is of far less importance in America, both positively and comparatively;—positively, because of climatic difficulties in the growth of it here, especially North of the Connecticut—and comparatively, because in that sense it comes in competition with Indian corn, the glory of American Agriculture and the staff of Ameri-

can subsistence. It is some obvious and acknowledged differences of climate and staples like this, which prompt many people to raise up their lazy voices against all English agricultural writings, and the trial of all new things introduced in English Agriculture and Horticulture, and against English animals and implements. This stereotype cry of *difference of climate* is, we hear too often, the convenient refuge of ignorance and indolence. Listen to it, and we should become stationary as the Chinese. On the contrary, we should keep our eye constantly on what the science and the wealth of Europe is doing in the melioration of fruits, the variegation of flowers, the improvements of machinery, and in all the useful and ornamental inventions. How, but by an honorable spirit of inquiry and emulation, has Mr. WILDER, the enlightened President of the Horticultural Society of Boston, been enabled to exhibit several hundred varieties of pears, and flowers of Continental origin, in anticipation even of the London florists, and inconceivably beautiful? But to return to our subject. Conceiving it to be our duty to look out for whatever may be noticed abroad as new and valuable, we have selected three items from a single paper—a late London "Gardener's Chronicle"—to wit, *Italian Rye Grass*, for soiling; a *Strawberry*, which appears to excel in size even our own Hovey; and a *New Vegetable*.

As to the Italian Rye Grass, we are aware that it has been introduced, and that it *may* not possess the value ascribed to it, as in competition with Lucerne or Indian Corn, sowed for soiling; but surely an account thus plausibly representing one acre to yield $150 worth of grass, is at least *worth* reading, and the grass worthy of careful trial. The suggestion of using *liquid manure* will doubtless alarm the timid and horrify the lazy farmer; but boggle at it as he may, he *will have to come to it at last!* He must be blind, or worse, whom we shall not, sooner or later, cause to see, in the pages of this journal, how indispensable it is to adopt the means of saving and using the *liquid manure on his farm*. Yes! the day shall come, when any man who pretends to keep pace with the march of agricultural improvement, shall be put in Coventry by any Agricultural surveying committee, who is found to neglect and throw away that most valuable portion of his resources. That subject, we promise, shall be demonstrated, in a manner, by argument and illustration, to make every farmer feel that to wilfully lose the *liquid* excrements of his farm, is precisely as improvident as it would be to leave his meat-house open, or his wheat unshocked in the field after being cut. All in good time, my friends. For improvidence, for waste, for ill-success, and for ruin, you may plead anything else; but—*you shall not plead ignorance if you will only read!*

On the subject of soiling, once more, we need hardly suggest that every man must practice it on some scale, or ought to do it. He ought to have green food for his plow-horses at night, and, at least, for his milch cows. For this purpose a lot, smaller or larger, according to the number of animals, will suffice; but even for that there is a good and bad manner of preparing the ground, as there is a choice of crops, for the purpose. For the introduction and trial of new kinds of grains, grasses, fruits and animals, the agriculturist depends chiefly on the merchant farmer, or some other not regularly bred to the pursuit; and is it not too apt to be the case that, if his trial fail, he is succred at by "the practical man"—and if he succeed, after some years, the public profits by his enterprise, while he gets neither thanks nor remembrance? Who remembers Governor Randolph, the scholar, as the inventor of the hill-side Plow? or Commodore Stewart, as the first to send Guano to America twenty years ago?

P. S. Since the above was written, we have had an opportunity to observe that in New-England the practice of sowing corn broad-cast, for soiling, is extending, and seems to answer admirably. To save labor, the lots appropriated to this object should be near the spot where the food is to be consumed.

LOLIUM ITALICUM—*(Italian Rye Grass.)*—Much, and deservedly, as this Grass is esteemed where it has been cultivated, it may, perhaps, prove useful to some of your agricultural friends, and induce many who have not yet tried it to take an early opportunity of doing so, if you will publish a statement of the advantages I have derived and expect from its growth on a small scale under the following circumstances:

In September last, upon an acre of good loam, previously well drained and deep plowed, I sowed four bushels of seed. It vegetated quickly, and grew so fast that, considering it too thick to stand over the winter without injury from snow, I depastured it with sheep before Christmas. In February it was splendid keep for ewes and lambs; but having so little of it, as fast as the latter were dropped they were, with the ewes, turned upon it, each for a few days only, to give them a start before passing them on to the other keep, and in this way it was fed down close by a small flock of ewes with their couples. The liquid manure-cart then conveyed upon it a good dressing from the urine tank of the cow-sheds and stable. In April it was mown and consumed in the stalls day by day as long as it lasted, the liquid manure-cart being freely used, as fast as a sufficient breadth was cut for it to work upon, and I firmly believe I had considerably more than two tons to the acre. In the last week of June and the first of July, a second and equally good crop was cut

and consumed as before, followed in the same way by a dressing of liquid manure.

It is at this moment looking very luxuriant, but having no farther occasion for it in my stalls, I purpose cutting it the next time for its seed, and confidently expect to be enabled to do so by the end of August, and (from a little experience I have had this week upon another and very inferior piece of land) doubt not of obtaining at least forty bushels of seed, (now worth, I believe, 9*s*. or 10*s*. a bushel;) after which I shall give it another taste of liquid manure, and confidently look forward to a good bite, if not another cutting, by the end of October or beginning of November, thus obtaining, in all probability, something very like five crops within the twelve months, four of which may fairly be regarded as full crops. Those already had could, I think, hardly be surpassed for luxuriance.

The several applications of liquid manure were with ease pumped by a stout lad, and with one horse conveyed to the ground, and applied through a trough placed behind the carriage, each time in little more than half an hour; and I will venture to say that where, as in the present instance, land is near the steading, an acre may be dressed well with ease in less than four hours.

Four bushels of seed I am aware is more than usually sown, but the result has proved that under such severe cropping it was not too much; for the plant on the ground is, I consider, perceptibly thinner; but I have no doubt of amply replenishing this at the next cutting by the quantity of seed that will unavoidably be shed in harvesting it. After this I intend to harrow slightly, and manure the whole at one time with urine as before. If one were justified in entering into a calculation of the value of the obtained and expected crops, I consider it may fairly be set down thus:—

Dr.	£	s.	d.	Cr.	£	s.	d.
Plowing twice, 1 acre	1	0	0	Value of feed at Christmas, 1844.	1	0	0
4 bushels of seed, at 9*s*	1	16	0	First cutting, call it 2 tons of fodder, green, or 1½ as hay, at only £4 a ton, (worth this year £6)	6	0	0
Sowing and harrowing	0	4	0	Ditto, second cutting	6	0	0
4 dressings of liquid manure, too often regarded as of no value—say	1	0	0	Third cutting, say only 40 bushels of seed, at 9*s*.	18	0	0
Cutting twice for forage	0	5	0	1½ ton (deducting weight of seed,) of fodder	5	0	0
Once for seed	0	2	6	Value of bite in October or November,* say	1	0	0
Threshing, riddling, &c	0	10	0				
Rent, tithe, taxes, &c	3	0	0				
Total	7	17	6	Total	37	0	0
					7	17	6
				Profit per acre	29	2	6

The above happened to be the more convenient method for my purpose, and therefore was pursued; but I conceive it is by no means the most profitable, inasmuch as in an ordinary season, with liberal assistance, an early feed may be obtained in spring; two cuttings for seed during the summer months, and mown or depastured in autumn, thus increasing its value from £8 to £10 per acre.

It may possibly be said, "Oh, but four manurings in twelve months is a dence of a dressing." One moment's dispassionate reflection will, however, show that all these were easily and inexpensively obtained, that they were derived from a source by two many farmers thrown away as valueless, that they can be applied at less than a fourth of the value and expense of one ordinary application of solid dung, and with equal, if not better effect; if it were possible to prevail on them to save their liquid manure with the same degree of care they often bestow on trifles about a farm, in themselves of much less value, and instead of allowing it to pollute their own or neighbors' ponds, which is rendered the more inexcusable when a liquid manure pit may in all, or most situations, be made for less than 30*s*.

I am very sorry to say that I know an instance, between five and six miles only Northwest of the "faithful city," where lamentable pains and expense appear to have been taken by an otherwise exemplary farmer (or his landlord) to get rid of this valuable auxiliary, by turning it into a wide ditch close by the turnpike road side, deep enough to smother at least a hundred of her Majesty's honest peasantry at once; aye, and where, too, sundry statutable permissions (I will not say encouragements) "to be drunk on the premises" abound, so that but for the grim visage of that feudal ornament, a pair of stocks, and the good example and care of the rural authorities, there would be more or less danger of such an untoward event taking place. [T. F., Ham-hill, near Worcester.

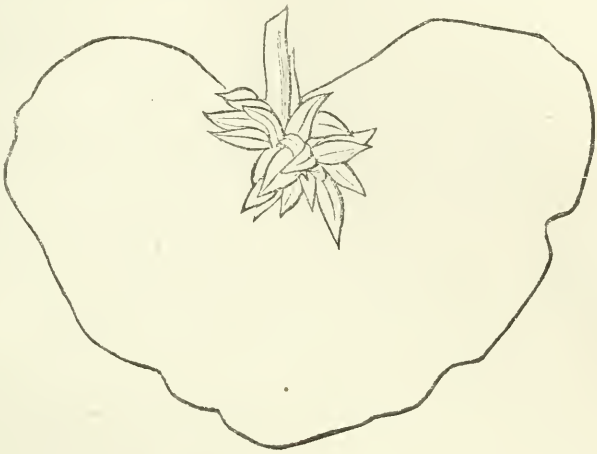
* Worth considerably more if it should grow to cut for the stalls.

New Vegetable.—In the "*Monthly Magazine*," for September, 1821, James Sibbald, of Paisley, writes as follows, of a new vegetable which, if it could be obtained now, would, I think, be a great acquisition:—"The Trottel or Treuttel root is the principal source of subsistence to the Squee Indians, Labrador, withstands the most severe frosts, and it bears, even in the depth of winter, curled, thick, crisp leaves, as tender as Asparagus, and something like Seakale. The root weighs generally from 8 to 10 oz., and is shaped something like a Windsor Bean, grows in clusters like Potatoes, when boiled, yellow-colored, and though drier, much resembles the Carrot. I plant the roots, cut in small pieces, in rows two feet asunder, and three inches deep, in August or September, and as the plant is of rapid growth, begin to top the herbage in winter, (December and January,) and in the spring months, when vegetables are rare, I dig up a plentiful crop (10 or 12 of each plant) of a delicate vegetable—most nutritious, and keeps well. It is now grown at Greenock, Paisley, and Bristol." T. W.

[What is this?]

Horticulture.—It may be interesting to the growers of Strawberries, to know what can be done with the British Queen, the remarkable specimens of which have, this year, excited so much attention about London. We, there-

fore, give a prominent station to the accompanying sketch of a fruit of this kind, forwarded by Mr. JOHN STOBBS, gardener at Doddington Hall, near Lincoln. The figure shows its exact size, and it weighed a little more than an ounce and a half; so that ten such Strawberries would make a pound. Has any one ever produced such a Strawberry as this before? We doubt it.



ON THE PRINCIPLES TO BE OBSERVED IN THE ERECTION AND CONSTRUCTION OF FARM-HOUSES.

ON some future occasion, we shall give ground-plans of Farm Buildings, suited to farms of different sizes and to the husbandry of different States. The buildings adapted to grain-growing Pennsylvania, to hay-growing Massachusetts, to sheep-growing Vermont, to tobacco-planting Maryland, to cotton-planting Carolina, and to sugar-planting Louisiana, obviously require to be on plans widely different, as far as the staple crops are concerned; but in the following observations on Farm Buildings, from a late number of the *London Agricultural Gazette*, there are principles laid down which are of general applicability, deserving to be heeded accordingly. But, alas! as was lately observed on the subject in the New-York *Albion*, in our country of change! change! change! there is so little of forecast, or permanence, that few things are done with reference to any entire plan, in which one part is to relate to another, and each to all the rest; with a view to a combination of conveniences, and the most economcial use of the whole. The fact is, that farming is, for the most part, undertaken without adequate capital. Men buy and settle upon *land*, without having in hand the requisite means to improve it; whereas, in England, no landlord will rent land to a tenant, who cannot first show that he has beforehand, more *money per acre* than the *average fee simple* value of all the land in any State South or West of the Chesapeake and the Alleghanies; moreover, as few know how long their land may remain in their own families, or how long it may be before they are either starved out, or tempted by delusive descriptions and the increase of their household, to sell out and "*move West*," improvements are made in detachments, without confidence of remaining to carry out any plans, even if they had the forecast to form one, and means to complete it.

An ill-contrived edifice is put up in one place, and another in its uses closely allied to it is, after some years, put up at a magnificent distance therefrom; so that much time is daily wasted in passing from the "great house" to the "Quarters"—from the "Quarters" to each other—from all of them to the cattle-yard, and from that to the stable; from the stable to the corn-house, and from that again to the granary; the tobacco-houses being as widely scattered as the premises will allow; few or none of them closely watched, and kept carefully clean and in good order: *constantly*, as they should be, the preservation of buildings making, most emphatically, one of those cases in which "*a stitch in time saves nine*." Let not these remarks be

deemed uncharitable or querulous. Much should we be rejoiced if we could give a reverse coloring to the picture; but *fiat justitia ruat calum*—we must speak the truth at all hazards.

Under all these circumstances, we would say to the young American farmer about to commence an establishment, to begin with his buildings under the supposition that his estate is soon to be divided among his children; one of whom is to have a smaller portion than the rest, in proportion to the cost of its buildings; and let him regulate the expense of his mansion accordingly. Without going into minute calculations, is it not obvious that when all probabilities and casualties are taken into the account, nothing can be more improvident than to invest an over-proportion of one's means in a *dwelling*, which must remain stationary, as much as to its original cost, and the interest thereon, with which it is to be charged, as in its locality; and to which, in the nature of things, the parts into which the estate must be divided will bear a less and less proportion in point of value. In a word from the certainty of frequent division of estates, equally by testament or descent, there is no country in the world where prudence so loudly enjoins great moderation of investment, in a mere residence, as in this; nor, when properly considered, does a costly one comport any more with good taste than with prudence. What farmer need desire to have a handsomer or better house to live in than Mr. Latrobe's neat cottage, *Fairy-Knowe*, of which the traveler gets a glimpse from the Thomas Viaduct, on the Baltimore and Ohio Railroad, at Elkridge landing? and that cost, we believe, about $1200. It was, however, far from our purpose, to have descanted on the proper plan or the scale of *Farmers' Residences*—so we return to *Farm Buildings*. Whether the young farmer's means be adequate or restricted, he should build, much or little, according to some *well-considered plan of arrangement*. If only one edifice can be built this year, let it occupy, according to his plan, a certain relation to those which are to be constructed when time and means allow it; and let him always bear in mind, that however humble the purposes for which the building is designed, there will yet be room for the exercise and display of taste and ornament, as well as convenience. There is opportunity for this even in a pigeon or a poultry-house; and since it costs only the trouble of putting them in the ground, let *trees* to be planted for embellishment, shade, and shelter. These are precautions that demand no considerable enlargement of means, or at increased expenditure, and therefore to omit them should be placed to the account of sheer indolence and want of sensibility, that indicate defect both of education and refinement.

To the *concentration* of the *farm buildings*, recommended in the following extract from the English paper, and by obvious economical considerations, there is the strong objection of liability to have all destroyed by fire, communicated by means of lightning or otherwise. To trust "all your eggs in one basket" is imprudent to a proverb.

This concentration of all out-buildings presents the more serious difficulty, in our country, where farmers do not know that they can, or else will not *insure their farm-buildings, or even their dwellings and furniture*. In England, on the contrary, it is the common practice to insure even the lives of their cattle against prevalent epidemics. Truly, with all our wisdom, the wisest of us have much to learn; and, generally, the most ignorant are those who think they know everything.

THE OUTHOUSES OF A FARM are those buildings in which the farmer stores and prepares his crops, rears and feeds his live stock, and houses his working cattle and implements. On their arrangement in regard to each other, as well as on the adaptation of each to its separate purpose, much of the farmer's profit necessarily depends. It is to the first of these considerations, the disposition of the several parts in relation to each other, that we shall now direct our attention.

The leading object to be aimed at in the arrangement of the outhouses of a farm is economy of time and labor in the performance of those operations which are to take place within them. The first principle by which we must be guided in an endeavor to effect this object is, the self-evident one, that there must be an immediate connection between those buildings in a homestead whose usefulness depends upon each other. In carrying out this principle, we shall find that the position of the barn governs, in a great degree, that of the other buildings; for the straw-barn being the great storehouse of forage and litter, from which the stables, feeding-houses and sheds and yards receive their supply, it is necessary that these be situated as near to it as possible, and those nearest to which the greatest and most frequent supplies have to be conveyed. Again, the straw-house is an appendage to the barn where the corn is threshed—there is a necessary connection here also. To the corn-barn, also, must be attached the building which contains the motive power to drive its machinery; and it is a convenient arrangement to have the granary, too, in immediate connection with the corn and dressing-barns.—Farther, the house where food is consumed should be in connection with, or at least not far removed from, the house in which it is prepared, and this again should be contiguous to the places where the food is stored. Lastly, that the cleaning out of the houses may not consume unnecessary time, the place where the manure is deposited should be near to them, and of ready access.

It should always be borne in mind that it is more important to save time in comparatively insignificant operations, if they be of frequent occurrence, than in large matters which are not often repeated. Thus, if the separation require to be made, it is better to have the house where

food is prepared, and whence small quantities are taken several times each day, close to the place where food is consumed, than to have it near the storehouse, from which the supply requires to be carried only once.

The second principle of arrangement which should guide us, although subordinate, is yet of great importance; it is to classify and arrange together the buildings used for like purposes.—An attention to this greatly facilitates the labors of the homestead. Thus, the houses and yards for particular descriptions of stock should be placed together; the working cattle should be kept by themselves; the cows of the domestic dairy should be kept apart from the feeding-stock; the pigs and the poultry should have their proper locality. It is of great assistance to this classified arrangement to have a working-court or yard, round which are assembled, in their proper places, the apartments for storing and preparing food, the sheds where the wheel-carriages of the farm are stored, the houses where the tools and smaller implements are kept, those in which the blacksmith and the carpenter work, and the others used occasionally for various purposes. And, in addition to this, it is important to place the highest buildings so as to afford shelter from the prevailing winds, and yet not to intercept the rays of the sun from the other buildings and the yards. In many situations it is desirable that the whole of the out-houses should be so arranged as to have one common entrance, which can be closed for security every night. This is especially necessary near towns.

It may be proper to remark that all the roads should be wide enough to allow a cart and horse to be turned on them; and that it is well that the yards should be so arranged as to allow of a cart being driven through them, which is much better than backing the horse.

So far, then, for the principles of arrangement of the buildings relative to each other. The next topic which demands our attention is the form which the collected buildings should assume, and this involves the consideration of aspect.

Under the idea of compactness, out-houses used generally to be arranged in the form of a square, with a central yard into which the litter was thrown; and here, uncheered by a ray of sunshine, wading in a pool of rain-water from the roofs of the buildings, and of liquid manure from the houses, the farming stock was suffered to languish. Professor Low, of Edinburgh, first showed the absurdity of this system, and pointed out the advantages to be derived by the stock from the admission of sunshine and air to their yards. He showed that these benefits could be best obtained by the form which also ensured other advantages—a long parallelogram. The Professor's principles of arrangement have been extensively adopted in modern homesteads, and have been advocated in almost every publication on Agricultural matters, although very seldom with the acknowledgment of the source whence they were derived.

The best form that the farm outhouses can assume—that which combines the greatest advantages—is a long parallelogram, with its diagonal nearly on a line from North to South. The prevailing and severest winds being from the West and West by North, the greatest possible amount of sunshine, and the best shelter may be obtained by having the sheds for the cattle and their yards open to the South and East. There are cases, however, in which this rule will not obtain, and these must be dealt with according to circumstances.

The buildings should be placed, if possible, on a gentle rising surface. If, where water-power exists, such a situation can be found, it is well to take advantage of it. But if to secure such power it is necessary to place the buildings where light, warmth, ventilation and drainage cannot be obtained in perfection, then the water-power ought to be sacrificed to these more important benefits. The position of the homestead is often determined by existing roads and divisions of the farm, irrespective of the eligibility of the situation in itself. This is an absurd practice, and cannot be too severely reprehended.

Among other matters demanding our attention in this preliminary notice, are the means for preserving the liquid manure made in the steading. The attainment of this important point is greatly assisted by the classification of the buildings before spoken of. Underground drains should be carried from the cow-houses, feeding-houses, and pig-sties, to one or more tanks. The tanks may be of two kinds; they may be adapted for making compost, in which case they should be in the form of a rectangular basin sloping inwards from the ends to its deepest point in the centre of its length, so that a cart may be driven through when the compost is carried out; and this, or something similar to it, is probably the most economical mode of using the liquid manure on a farm. Or the tanks may be in the form of a well, square, rectangular, or circular in the horizontal section, and arched or domed over. In this case the tank is used to contain the manure in its liquid state, and should, by puddling and the use of cement, be made perfectly water-tight. It must have a man-hole in the arch or dome, and another opening by which a pump may be inserted, or in which it may be permanently fixed. The drains, before entering this latter kind of tank, should terminate in a cesspool in which the liquid manure may deposit any sedimentary matter which would obstruct the working of the pump if deposited in the tank.

The eaves of all the buildings should be furnished with gutters, and the rain-water collected by them conveyed to underground drains by cast-iron pipes. The drainage of the site has already been spoken of as an essential requisite. It should be thoroughly done. In too many instances remedies are applied to the foundations of buildings, to prevent dampness from ascending, while the only true remedy is, by draining thoroughly, to remove the cause.—As drains very often harbor vermin, cesspools should be constructed in them, at proper places, without the buildings, which will effectually bar their progress.

On reviewing the principles here recommended to be observed in the collocation of the out-houses of a farm, it will be seen that their application in practice must be attended with no little difficulty. Slight variations in management, to suit the soil, and other peculiarities of the farm; the nature of the power to be employed in threshing, &c.; the requisite arrangements for shelter in exposed situations, when such situations cannot be avoided; and the nature of the ground on the site of the buildings, all tend to embarrass and prevent the application, in any single case, of all these principles in their integrity. The judicious designer knows

in such cases what to forego, and and what to secure; and endeavors, when a sacrifice has to be made, so to arrange, that all the more important principles may be observed and carried out.

Before concluding these remarks, it may not be amiss, in a sentence or two, to consider the *appearance* of out-houses, arranged on the principles here advocated. Premising, then, that we consider any attempt to mask or disguise the character of a building, as indicative of what, in ordinary language, is called bad taste; and that the expression of character and fitness, on the contrary, is in correct taste, we shall find that this expression of character and fitness in these buildings, can easily be obtained; in many cases the whole steading can be arranged symmetrically; and where this is not attainable, the extended lines of building, the archways, the varying outline caused by the different hights of the houses, and the numerous gables, harmonizing with that of the stacks in the barn-yard, never fail to give piquancy and picturesqueness. There ought to be no mock windows, mock doors, or arches; no false gables; let every thing be real, and expressive of its use; and trust to that expression, as the best æsthetic principle of design in such erections.

MR. HAMMOND, OF WORCESTER, MASS.

HIS MANAGEMENT, AND ITS RESULTS, ON A FARM OF 121 ACRES.

We transfer, with particular pleasure, from that excellent Journal, the American Agriculturist, the following notice of the "Farm of Mr. Hammond," but cannot get our own consent to do it without invoking to it the particular attention of the many, in other States of this Union, who, with four, and in many cases more than four times his number of acres, inherited, (not bought, like his, by their own labor,) are every year going behind hand, and in a fair way to be *sold out!* Who can reckon the value of examples of industry and good management, such as the one here exhibited? How happy must be such men—how justly proud have they a right to be, who thus enjoy the sense of *self-made independence!* How eminently worthy of being honored in the esteem of all who understand in what consists true dignity of individual character, and the true foundations of a Commonwealth's prosperity!

How striking would be the difference, if one had leisure to exhibit in all their features, the portrait of the industrious Farmer, on his small estate, keeping an exact account of outlay and income, studying to turn every thing to account, and finding his greatest pleasure in the regular husbandry and steady improvement of his own affairs; as contrasted with his neighbor on his 500 acres, who rides about the country in search of sensual excitement, answering the low purposes of narrow-minded partisans, leaving every thing at home to take its own course, without care or direction, until he reads his own ruin and disgrace in the Sheriff's list of executions, in the sighs of a broken-hearted wife, and the tears and rags of children beggared and degraded.

FARM OF MR. HAMMOND.

This farm lies in the town of Worcester, Massachusetts, and is one mile from the Court-house. It comprises 121 acres, 17 of which are in wood land, 8, if we remember right, still in unreclaimed bog meadow, and 4 are taken up with yards and buildings, leaving, in fact, only 92 acres actually in tillage. We are thus particular in this statement, in order to show our readers how much may be realized from a moderate-sized farm, of an ordinary quality of soil, when eligibly situated and properly managed.

But first of the man. Mr. Hammond is an excellent specimen of a hard-working New-England farmer. He began the world with little or nothing saving his own hands, a good constitution, active and industrious habits, and indomitable perseverance. He informed us that for the first six years after becoming of age, he worked out by the month for other farmers, and from his wages at the end of this time had saved enough to set up for himself; but it was not till 1835 that he was enabled to purchase his present farm. When he came on to it the land was in quite an exhausted condition, the fences indifferent, and the buildings so miserable, that neither man nor beast could inhabit them with any comfort. Now he has erected on it a noble barn of handsome architecture, 90 by 42 feet, which will hold 80 tons of hay, and has in addition numerous stalls for his cattle; built him a pretty two-story house, and several out-buildings; made new fences; planted an ample garden with fruits and flowers; set out a large orchard of choice apple-trees; drained nearly worthless bog meadows, and transformed them into the best of grass land; cleared off the stone and enriched his land so highly that he gets on an average 2 to 3 tons of hay per acre, 45 to 60 bushels of corn, and 40 to 50 of barley, where previously not half, and in some instances not one-third of these crops were gathered; and accomplished other things too numerous to mention: and all this, it must be understood, besides respectably supporting and educating his family, has been done from the earnings of the farm. Not a dollar is he in debt for it, and not a dollar has he brought in by foreign business to improve it, unless a few trades in selling off his aged animals, and buying younger ones to replace them, can be so considered.

How has this been done? we hear our readers ask. As we said in the beginning, Mr. Hammond's farm is within a mile of the town of Worcester, which affords a ready market for his hay, at the average price of $15 per ton, corn 75 cents per bushel, rye 87 cents, barley 75

cents, oats 33 cents, potatoes 30 cents, turnips 17 cents, milk 4½ cents per quart, and a good price for all the vegetables grown in a garden of between two and three acres. The farm now produces 75 to 80 tons of hay per annum; 150 to 200 bushels of corn; some barley, rye or oats; 800 to 1000 bushels potatoes; 400 to 500 bushels turnips: vegetables from the garden, and considerable fruit. The stock is 2 horses, 4 oxen, 17 cows, and a few swine. The cows are kept for the purpose of supplying the citizens of Worcester with milk.

When Mr. Hammond began his operations here, he informed us that in order to fertilize the nearly exhausted soil, he took his produce to market, and after disposing of it, brought back manure. But this proving a laborious job, and learning the value of muck as a fertilizer, and having any quantity of it in a bog meadow, he commenced carting it into the barn-yard during the summer, fall and winter, as he found time, spread the stable manure upon it, and thus ever since has made several hundred loads annually, of a compost quite equal, he thinks, to ordinary barn-yard manure.

The rotation of crops here is adapted to the situation and market. Grass land is plowed in the fall, the next spring highly manured broadcast, again plowed, and then well harrowed and planted with corn. The second year it is sown with barley. This grain is worth nearly as much as rye, and suiting this kind of soil well, nearly double the number of bushels per acre can be obtained of it that can be grown of rye. Grass seed is sown with the barley, and after that the land is kept in grass as long as it is thought profitable. Mr. Hammond's method of raising turnips is in accordance with an old practice in Massachusetts. The fore part of July the cultivator is passed up and down between the rows of corn, which cuts up all remaining weeds, and leaves the land free and light. Turnip-seed, of the common field kind, is then sown, and the men follow and give the corn its last hoeing. In performing this operation they cover the turnip-seed sufficiently well, and it usually produces about 100 bushels to the acre. One season Mr. H. got 650 bushels from four acres. We think it requires a very fertile soil or high manuring to warrant one in taking two crops at the same time; and though it may be presumptuous to differ from so good an authority, still we think if a single acre were devoted to ruta-baga, it would be better than raising the common turnip among corn, as the former is much superior to the latter in nutritive qualities, it keeps later and better, and 600 bushels may be obtained on an average from a single acre, and perhaps 800 to 1000 as highly as Mr. H. would cultivate them.

There are many other little things about this farm which we would gladly speak of had we space; suffice it to say, that Mr. H., so far from being satisfied with what he has already accomplished, thinks he is merely prepared now to realize something for his improvements. He will undoubtedly derive a handsome income from his farm hereafter, and manage it with much less labor. Yet this great truth has already been exemplified by him, namely, that land of a moderate degree of fertility, properly managed, can be greatly improved from its own resources, and at the same time respectably support those who cultivate it. For one, we feel grateful to Mr. H. for doing what he has, and we recommend all in his vicinity to visit his farm, and make themselves familiar with his practice; for a better example, as far as he has gone, we know not among our whole acquaintance.

ON THE ATMOSPHERE OF STABLES.

The frequent and violent exertions which man requires of the horse, renders it a matter of the highest importance that the animal's physical condition be as perfect as skill and attention can secure; and as there are no organs of this noble animal so severely taxed, during the performance of either fast or heavy work, as the organs of respiration, it is obvious that too much attention cannot be given to all circumstances which tend to secure perfection in the condition of that delicate apparatus which plays so prominent a part. A pure and uncontaminated atmosphere, in all respects suited to the process of respiration, is, therefore, a *sine qua non*: one cannot help, for these reasons, expressing surprise at the almost universal inattention to stable ventilation, which so lamentably prevails in even many of our first-class establishments. But there is no circumstance connected with domestic life that appears to me more extraordinary than the almost universal want of attention to scientific arrangements in the construction of modern buildings of every description, both public and private, from the largest theatre, or assembly hall, down to the cottage of the most humble peasant. It is not, therefore, wonderful that gross errors may be discovered in the tenements devoted to the accommodation of our domestic animals. That these occur to a much greater extent than many intelligent persons are aware of, I shall presently show. I hope I may confidently presume that most educated persons are aware that air once breathed by an animal is, by the simple process of respiration, converted into a deadly poison, and, therefore, should be instantly removed from its presence, and replaced by a proper supply of a pure and wholesome air. It is well known that the oxygen of the air is absorbed, and carbonic acid gas is thrown out at each expiration—a gas which neither supports life nor combustion: of the truth of this, the unhappy fate of the unfortunate sufferers in the Black Hole of Calcutta but too painfully demonstrates. I could cite, were it necessary, numerous familiar illustrations of this subject, but I have no doubt the following sample will serve to inform such of your readers as may not hitherto have given especial consideration to theories of respiration, and who are, therefore, unaware of the importance which attaches to the subject.

All have heard of the fatal accidents that frequently occur in breweries, from persons incautiously descending vats while these are surcharg-

ed with the products of fermentation. It is the carbonic acid gas which kills the individual in this case; and who is not aware of the danger of descending close, deep wells, where foul air has accumulated, and rendered the atmosphere obnoxious to human beings? Again, carbonic acid gas proves to be the baneful agent: few, perhaps, are cognizant of the fact, that if a bird be suspended from the roof of a closely-encompassed bed, the creature is speedily put to death—it is poisoned by exposure to the carbonic acid gas—the natural product of the respiration of the persons occupying the bed! Although this gas is naturally heavier than common atmospheric air, it nevertheless, when heated by the process of respiration, becomes much lighter, ascends, and occupies the space nearest the roof of the chamber where it may have been produced; so that persons near the floor, having a plentiful supply of cold air, may suffer no inconvenience, although they, most assuredly, by each act of expiration, are slowly and silently contributing to the destruction of the ill-fated victim in the cage. But the products of respiration, poisonous although they be, are the result of vital phenomena, and, therefore, cannot be dispensed with nor prevented; but the grand source of vitiation to which I am desirous to direct attention, is both removable and preventable, because it is dependent on the ammoniacal gas which is disengaged from the decomposing urine that is absorbed by the porous floors of stables. Now let me shortly describe the condition of stable-floors as these are usually (I may say invariably) constructed—and suppose we take a stall in the Piershill barracks as our text: nothing could be more unscientific than the arrangements which are here everywhere to be observed. All that seems to have been aimed at is merely to secure a hard and resisting footing for the animals, and that this may be effected at the cheapest rate, the following mode of procedure is practised:—Boulders, or irregular blocks of stone, are placed in a bed of sand, or small gravel, (I beg especial attention to this circumstance,) and it is believed that when these are made to present a fair surface, that the "job" has been creditably executed; but what are the facts? They are simply these: When the liquid manure of horses is dropped on such a floor as that which I have described, they rapidly percolate between the interstices of the irregular stones—decomposition immediately ensues, and deleterious gases are abundantly disengaged. I would, therefore, beg to press upon the attention of all whom it may concern, that the principle of rendering stable-floors impervious to moisture should never be lost sight of; without attention to this desideratum the most ingenious schemes for ventilation must be stultified! So rapidly do the component parts of urine assume the gaseous form, that it has surprised many to find, on examining an imperfect floor, that percolation has extended to so small a depth, but the true explanation of this circumstance no doubt is, that the recently-dropped urine comes in contact with materials in a high state of chemical action, which, like yeast to the wort, immediately induces a similar condition in the atoms of the recent materials, ammoniacal gas is formed, which ascends and pervades the entire apartment. The irritating ammoniacal gas I have frequently found, on going into a stable in the morning so concentrated that I could not breathe without coughing, and my eyes lachrymated as if a newly-cut onion had been hanging under my nose. Now, the products of respiration contributed but in an inferior degree to this state of vitiation. I repeat again, that it is impossible to preserve the purity of the atmosphere of a stable, while its floor continues pervious to moisture. I, therefore, cannot too strongly urge this fact upon the attention of every one who may find his stables in an objectionable and unwholesome condition; and it will be satisfactory to know that the means by which the desired improvement may be effected, involves neither difficulty nor expense.

Let the centre of the causewayed stall be removed 2 feet in breadth, and 5 feet in length, measuring from the croup end of the stall. Flags of sandstone pavement, of 1 foot in breadth, 3 inches thick, and of convenient length, having the inner or central edges beveled to such an angle as that when the two are brought together there will be a space or central gutter formed like an inverted V, 1½ inch in breadth at the surface, and 2 inches deep at the apex of the inverted cone, which space must be filled with cement or pitch—a slight downward and backward inclination must be given to the paving-stones, so that whatever liquid may be dropped upon them, shall be rapidly conducted towards the hind quarters, and thence conveyed on the surface to the point in the exterior found most convenient for a tank, or reservoir, where it may be stored till required as manure. I find the making such an arrangement as I have shortly described would cost for materials about 10*s*. per stall—10 feet for each stall, and 10 feet for that part of the floor immediately behind the animal opposite his stall. A most superior article I know could be furnished by Messrs. J. Paton and Sons, of Ayr. The excellent quality of their sandstone, and the great advantages of their ingenious and powerful stone-cutting machinery gives to their establishment a peculiar claim to preferment.

I shall conclude this perhaps already too extended communication, by assuring gentlemen who may adopt such structural arrangements as I have proposed, that they will have no reason to regret their conduct; as to the pecuniary outlay which these improvements would require, you'll

"Let me whisper in their lug,
That's ablins nae vexation;"

because all that is to be done is to give their noble animals (whose faithful servitude deserve so well at their hands) credit for one year, as the following statement will clearly demonstrate.—A horse voids more than 3 lbs. of urine daily—or say—1100 lbs. per annum=21 lbs. ammonia =180 lbs. guano, 10*s*. So that he pays like a gentleman for the enjoyment of an unvitiated atmosphere.

In a future communication I will endeavor to give a popular description of the theory of ventilation, and the contrivances by which fresh air may be supplied to stables, and modes by which it should be removed when it becomes vitiated from natural causes. The necessity there is for rendering stable-floors impervious to urine appears to me so obvious, that I flatter myself no sensible man who may chance to cast his eye over this hurried and imperfect paper will hesitate for a moment in adopting some plan, which shall have the effect of rendering his stable-floors impermeable to liquids. Until this is effected, it is idle to talk about any ventilating scheme whatever; therefore, I say—Reform your Stable-Floors!!! W. D. Guthrie.

LETTER FROM GENERAL DEARBORN.

REFLECTIONS ON THE PROGRESS OF AGRICULTURAL IMPROVEMENT. AND THE POLITICAL AND MORAL INFLUENCE OF RURAL LIFE.

Hawthorn Cottage,
Roxbury, Mass. Aug. 29, 1845.

Dear Sir—I am extremely gratified with the first number of your Farmers' Library. I have read it with deep interest and great pleasure. Glad am I to find that you have again assumed a position which you so early, long, and honorably occupied, for the purpose of accumulating facts, truths, and principles, on all the numerous branches of rural economy, and reflecting back their concentrated radiance, for the benefit of that immense portion of the population of these United States who are practically engaged in tilling the earth, or delight to dwell in the midst of the naturally grand, as well as the artificially embellished scenery of the country.

Within this century, more has been done for the advancement of cultivation, from the humble cottager's rood of ground to the broad domain of the opulent, than in all preceding time, since the decadence of the most flourishing empires of antiquity. Science has come down from her lofty throne, and united the powers of Genius and Erudition with the physical energies of Art; while the Agriculturist, Mechanic and Manufacturer have discovered that they must be instructed by the lessons of Philosophy and the facts of Experiment. to ensure favorable results from laborious enterprise.

In this country, the occupation of the husbandman, and a residence in the country, have not been sufficiently appreciated; but, with the advancement of intelligence and the augmentation of wealth, we shall, like the Egyptians, Israelites, Persians and Romans, in olden time, and the British in modern, go out from the thronged and uncongenial cities, to find rational employment, real independence and substantial happiness in the healthful and agreeable quietude of a rustic villa.

How great and admirable is the moral influence of a Home in the country! What pleasing associations are connected with that most significant Saxon word!—what thrilling reminiscences does it call up!—how comprehensive the terms! for it includes place, time, kindred, friends, and every event of the most interesting and never-forgotten period of our existence. It is within the sacred precincts of such a dwelling-place that the most exalted virtues are best inculcated and established; there is patriotism the most perfectly developed; there is piety the earliest and most certainly induced, and pure religion made manifest, by being good and doing good; there the most ardent and enduring parental and filial affections are implanted; there Letters, Science and the Arts have their altars; there sentiment, and profound thought, and all the endearing qualities of the heart, and the most lofty attributes of the mind, are evolved.—From the country, in all ages of the world, have gone up to the capitals of empires, the eminent statesmen, legislators, orators, jurists, and those mighty men who have commanded victorious fleets and armies, or guided the destinies of nations. From thence have come the great heralds of every science, the distinguished proficients in the Arts, and the illustrious disciples in the vast and various departments of Literature. It was in gardens, the umbrageousness of forests, and on the mountain-tops, that God and His revelations were made known to man; while the temples of Plutus have been reared in cities. Those great emporiums of commerce must be regarded only as immense ware-houses, where the products of the whole earth are to be received, bought, sold, and distributed; places where wealth may be accumulated, but not rationally expended; and therefore it is that the home of the nobles and affluent in England is in the country. In that nation, the intelligent, enterprising and ingenious, in every branch of human industry other than the tillage of land, seek fortunes in cities for the express purpose of ultimately being enabled to become proprietors of estates, and LIVE in the COUNTRY. It is that univeral passion which has converted the island of Great Britain into a garden.

It is in cities, notwithstanding their external magnificence, that ignorance, vice and crime have their location. In their dark and endless labyrinths, misery, in its direst aspect, is endured; for the unfortunate and wretched have no home in cities—strangers are they in the midst of multitudes of strangers, where individuality is lost; they are left as entirely desolate, unregarded and hopeless, as if abandoned to destruction in the interior of a wilderness. Therefore, let the poor avoid cities, and become the happy inmates of a cottage; while the successful in the career of fortune should emulate the

example of Cicero and Pliny, Bacon and Scott, Washington and Madison, by retiring from the great Babylons of the nation, and encouraging Agriculture, by becoming its patrons—extending instruction by experiment—and exciting a taste for Horticulture, by the introduction of useful and ornamental trees, shrubs, and herbaceous plants, and the picturesque and beautiful embellishment of their grounds; and thus render themselves the honored benefactors of the present and all future generations.

With the highest respect,
Your most ob't serv't,
H. A. S. DEARBORN.

JOHN S. SKINNER, Esq.

JUDGE ROST ON THE PROGRESS OF AGRICULTURAL IMPROVEMENT.

WE have much pleasure in giving extracts from a Letter of Judge ROST, though not quite sure that it was written for publication. We deem it fortunate to have so soon attracted the regards and good-will of correspondents so well qualified, notwithstanding their self-distrust, to take a leading part in the accomplishment of the objects we have in view, as are those who have already come, kindly, to our assistance.

ST. CHARLES. Aug. 23, 1845.

Dear Sir—I received, long after its date, your kind letter, and the first number of the Farmers' Library, to which I request to be considered a subscriber. I have no doubt that, under your superintendence, that publication will be useful, and it will afford me pleasure to promote its circulation. I have no copies of my previous communications to the Agricultural Association of Louisiana, and, its records being kept at Baton Rouge, I cannot, at present, procure them.

Your wish that I should occasionally contribute to the pages of your periodical, presupposes in me abilities which I do not possess. The more I feel the importance of communicating to the Agriculturist the knowledge that should guide his art, the greater the difficulty appears to me of imparting that knowledge in the simple, concise, and exclusively practical mode suited to his usual education, his habits of thought, and his limited leisure. If it be gratifying to know that, in the study of Agriculture, the Schoolmaster is abroad, we must not forget that men cannot be taught faster than they can learn, and that the besetting sin of schoolmasters is, teaching too much.

Mr. Petzholdt's observation about the English agriculturists—that to do as their fathers have done, is deemed by them an unquestionable proof of wisdom—is incorrect, and casts unmerited censure on that sterling class of good men and true. To learn all that their fathers knew has been their constant practice, and that is an unquestionable proof of wisdom. But they have made, from time to time, important additions to that knowledge. If they have not oftener availed themselves of the aid of Science, it is because the votaries of Science have not, until lately, applied it with success to the objects of rural pursuit.

Agriculture, left, in a great measure, to its own resources, has continued to improve, and has obtained great results. Whoever compares with the England of the present day that which Cæsar invaded—a country covered with forests and marshes, where the inhabitants sowed no corn, and princes dressed with skins—will scarcely deny that Mind has had something to do with the change. The facts and the rules of action by which the change has been effected, form an important part of human knowledge; it is that knowledge which the agriculturist acquires from his ancestors. Learned professors may not call it Science, because it is not taught in Universities; it includes, notwithstanding, not only the art, but also the science of Agriculture; and it is vain to deny that both have, of late, advanced rapidly. The system of interchange of crops—the use of green crops—the improvements in the breeds of all domestic animals—thorough draining—subsoil plowing—the use of many new manures—are all recent and valuable improvements. At this stage of progress, experiments were being made in various places, to discover the best mode of applying manure, and the kind of manure best suited to each particular plant. Gypsum had already been found to be the food of clover—bone-dust that of turnips; and there is no reason to doubt that European agriculturists would, without assistance, ultimately have acquired the knowledge, which the Chinese are said to possess, of feeding plants with the various substances they require at the different stages of their growth. Liebig came, and gave direction to their researches; he told them what each plant is made of, and what it feeds upon in the course of its development, and also how they could procure the food it requires. Valuable as that discovery undoubtedly is, it forms no part of Agriculture, and belongs exclusively to Chemistry. That

science now guides the agriculturist in his investigations, as Astronomy and the compass guide the navigator in his course.

It is no way to entice agriculturists to the acquisition of knowledge, to begin by telling them that they and their ancestors have been heretofore ruled by prejudice and sunk in degrading ignorance; and if, in addition to this, it is attempted to make them forsake the plow for the purpose of learning, not the science of Chemistry, but its words and phrases, depend upon it they will dismiss the Schoolmaster, and say of him, as the Haberdasher said of Mr. Pickwick, "the honorable gentleman is a humbug." Tell them the truth—tell them that the experimental mode of investigation is right, and must not be changed; satisfy them that, by following it, they have learned much, and raised their art to the dignity of a science. Show them, then, in what manner Chemistry has lately placed within their reach the means of obtaining additional knowledge, and you may confidently trust them for the acquisition of it.

Very respectfully, your ob't serv't,
P. A. ROST.

J. S. SKINNER, Esq.

ON AN IMPROVEMENT IN THE MODE OF ATTACHING HORSES TO WAGONS.

BY J. H. GRIEVE.

HAVING observed amongst the topics proposed by the Society as subjects for prize essays, that of the use of one-horse carts, I thought it might be agreeable to you to receive some remarks relative to different modes of traction which have been suggested to me by actual observation, and which, so far as my knowledge extends, have as yet passed almost without notice.

There is no mechanical reason why a single-horse cart should possess any advantage over a four-wheeled wagon; and if that opinion has gained ground in this country, it is wholly to be attributed to the defective manner of application of horse-power.

In one-horse carts, a part of the load weighs upon the saddle placed behind the shoulders of the horse; and, as the principal fulcrum upon which he acts is concentrated in his hind-feet, it may, at first sight, appear that the load upon the back would assist in the effort of traction, and I have no doubt that it does so to a certain degree; but this small advantage is only gained at the expense of the muscular power of the animal, and has a natural tendency to exhaust and fatigue him.

If the use of wagons has hitherto proved unsatisfactory, the cause is merely that no sufficient care has been taken to ensure the *simultaneous* effort of the horses, so that a great part of their power becomes inefficient.

Nothing, indeed, can be more opposed to reason and good sense than the manner of yoking several horses in tandem that is usually practised both for carts and wagons, particularly in the south of England.

In the first place the shafts are often too much elevated, and then the shaft-horse is borne to the ground by the efforts of those that precede him, or he is made to swerve from side to side by the alternate jolting of the wheels, or by the leaders varying from the straight line of traction.

In the case of four-wheeled wagons, with horses yoked abreast, the traces of each horse are always fixed to the splinter-bar; it is more than difficult for the driver to ascertain if all his horses are exerting their strength together, and it is almost impossible for him, even with the utmost care, to force them to do so.

A much better method of yoking has been applied for ages past to the plow, viz. that of the swing-bar; but, strange to say, this system has not been adopted for carriages, with the exception of the leaders of stage-coaches; and this only proves that convenience, or, we may say, necessity, has been the primary cause of its being adopted at all, and not any sense of the superior mechanical arrangement of the system.

A little reflection will, however, show that this arrangement is better adapted than any other to produce simultaneous action—each horse being so placed respectively to his neighbor as to operate on a balance-beam; and it is self-evident that neither can draw unless the other acts as a counterpoise: the result is that the full and united force of the team is obtained for the purposes of traction.

For centuries past this system has been successfully applied in Belgium to the yoking of horses to four-wheeled wagons; and I could cite various instances of great loads conveyed in that manner, but will only mention a single instance of a load of goods which I myself saw weighed, and which was brought from Antwerp to the neighborhood of Mons, a distance of about 72 miles. The wagon was a very heavy one, with the wheel-tires 8 inches in breadth, and was drawn by five horses, and the load weighed fully 14 tons. Now when we take into consideration that several considerable acclivities had to be surmounted, at only two of which spare horses had been used, this example alone is sufficient to demonstrate the evident superiority of this system of traction. Doubtless the paved roads offer less friction than our usual macadamized ones, but this advantage will not account for the marked superiority of this load, which amounts, including the weight of the wagon, to about 3¼ tons per horse.

I may observe that in Belgium the load is strictly limited, by law, in proportion to the breadth of the tires, and that a greater load than

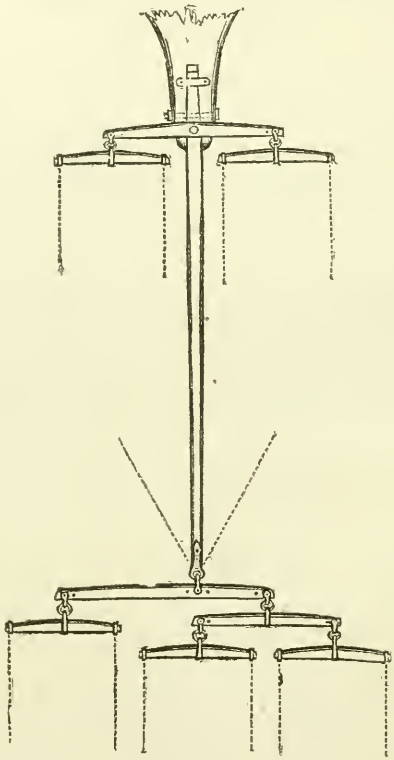
that above cited could not be conveyed during fresh weather; but instances have occurred of much heavier weights being drawn by the same number of horses, during hard frosts, when no injury can be done to the roads.

The horses usually employed on the road are of the old Flanders breed, the same as the common dray-horse in London, but evidently inferior to them in strength and weight.

Wagons of the same nature, but of a lighter construction. are also generally employed for farm purposes, and are found convenient and effective.

The Belgian Government have applied the same principle to the yoking of the artillery-trains; and it is certain that no guns of the same weight, and drawn by the same number of horses, would otherwise be able to traverse rough and uneven ground with the same facility.

It may be remarked that provision is made to adjust the leverage to the power of each horse, so that the pairs may be always equally matched, if not in strength, at least in their effective efforts. To explain this more clearly, I have subjoined a diagram representing the fore-train of a wagon adapted for five horses. It will be observed that spare holes are provided in the swing-bars to change the leverage.



N. B. It is curious, but nevertheless the case, that the whole team of five horses is guided by a single small line tied to the middle of the bridle-reins of the off-hand leader.

3 *King's Road, May* 12, 1845.

[Jour. of Royal Ag. Soc. of England.

Grafting.—It is often, in grafting upon slender stocks and branches, very inconvenient to attach and support a great lump of clay, which, in spite of the greatest care and attention, will, either in very wet or very dry weather, crack and fall away. Last Spring I made trial of sheet India-rubber, cut into narrow strips or bandages, from ½ to ¾ of an inch broad, which I applied to the graft—having first fixed the graft with bast—and with success. The India-rubber presents all the requisites sought for in clay; it is air-tight, and water-tight, and, moreover, it will not fall away; and it is elastic, which admits of the swelling of the scion in its growth, and it is applied with perfect ease and quickness. After wrapping the bandage round the graft and stock, as you would a linen bandage on a cut finger, the last turn only requires securing by tying with a bit of thread or thin bass; and it has a very light and neat appearance, when the operation is completed.

G. L.

PARING AND BURNING

Is a process much used in England for restoring old and foul land to cleanliness and fertility. In this country we have never seen it put in practice, except by Mr. Sotham, at Hereford Hall, near Albany. The operation is carried on with a facility and despatch that we should not have expected, and, as we are told, with results altogether satisfactory. We have seen so much land in similar condition, and therefore to all appearance inviting the application of the same process, that we have deemed it expedient to copy from Rev. W. L. Rham's Dictionary his description of the operation and its objects.

PARING AND BURNING.

This operation consists in cutting a thin slice from the surface of land which is overgrown with grass, heath, fern, or any other plants which form a sward by the matting together of their roots. The sods are allowed to dry in the sun to a certain degree, after which they are arranged in heaps, and burnt slowly, without flame or violent heat. The result is a mixture of burnt earth, charred vegetable fibre, and the ashes of that part which is entirely consumed.

The object of this operation is twofold: first, to kill insects and destroy useless or noxious weeds completely; and secondly, to obtain a powerful manure, impregnated with alkaline salts and carbonaceous matter, which experience has shown to be a very powerful promoter of vegetation.

The instruments by which this is effected are, either a common plow with a very flat share, which may be used when the surface is very level without being encumbered with stone or large roots, as in low, moist meadows; or, in most other cases, a paring-iron, which is used by hand. The crossbar of this instrument is held with both hands; and the upper parts of the thighs, being protected by two small slips of board, push the instrument into the ground, so as to cut a slice of the required thickness, which is then turned over by moving the cross-handle. The labor is severe, and a good workman can scarcely pare more than one-sixth of an acre in a day. The price of this work is from 15*s*. to 25*s*. per acre, according to the price of labor. The drying, burning, and spreading of the ashes are contracted for at from 10*s*. to 15*s*., or more; thus the whole cost is from 25*s*. to £2 per acre. In France it is done by a *cob*, which is like a shipwright's adze, and the operation is called *écobuer*.

Paring and burning the surface is an almost invariable preliminary in the converting of waste lands to tillage; and where these lands are in a state of nature, overrun with wild plants which cannot be easily brought to decay by simply burying them in the ground, burning is the readiest and most effectual mode of destroying them. In this case the practice is universally recommended and approved of.

But it is not only in the reclaiming of waste lands, and bringing them into cultivation, that paring and burning the surface is practised. The fertility produced by the ashes, which is proved by the luxuriance of the vegetation in the first crop, has induced many to repeat this process so often as materially to exhaust the soil, and induce partial sterility. Hence the practice has been recommended on the one hand, and strongly reprobated on the other.

When we come to apply to the subject the test of experience, and reason correctly on the facts which are presented to us by the abettors of the practice and its adversaries, we shall find that the advantages and disadvantages arise chiefly from the circumstances under which the

operation is carried on. But it may be necessary to an impartial examination of the subject, to inquire into the changes produced on the substances subjected to the process of burning, when it is done with due precautions.

In burning vegetable matter in an open fire, the whole of the carbon is converted into carbonic acid and flies off, leaving only some light ashes containing the earthy matter and the salts which the fire could not dissipate. These are no doubt very powerful agents in promoting vegetation, when they are added to any soil; but they are obtained at a very great expense of vegetable matter, which, by its decomposition in the earth, might also have afforded food for vegetation. If the earth which is burnt with the sods is of a cold clayey nature, the fire will change it into a kind of sand, or brick-dust, which is insoluble in water, and corrects the too great tenacity of clays, by converting them more or less into loams. This is so well known that clay is often dug out of the subsoil to be partially burnt. On stiff clay soils, therefore, there is a double advantage in paring and burning, that of the vegetable ashes and of the burnt clay. When the fire is so managed that the vegetable matter is only partially burnt, the oily and inflammable portions being converted into vapor by the fire without being destroyed, and absorbed by the earth, the effect produced is only to impregnate the earth with minute particles of matter, readily converted into the constituent parts of vegetables. The earth is the mere recipient of these particles, which are held in its pores, as water is in a sponge, ready to be let loose to any substance which has the power of attracting them. The moisture, which the dry earth will also absorb from the atmosphere if no rain should fall, is retained and increased by the effect of the salts with which it is impregnated. It is uniformly observed that turnip-seed, which in most soils will not vegetate without heavy dews or rains, if sown in dry weather, scarcely ever fails to spring up in the ashes of a soil that has been pared and burnt. May not this be ascribed to these particles, which have been taken up by the earth in the operation of slow combustion, absorbing moisture from the air, and giving it out to the seed which has been sown? It does this better than a heavy shower would: a heavy shower soaks the ground for a short time, and swells the seed: but, if it be succeeded by a hot sun, the water evaporates so rapidly that the seed loses its moisture, and vegetation stops. The earth, which attracts moisture from the air, keeps it, its absorbent nature preventing the evaporation; and it furnishes it gradually to the vegetating seed as it is required. The wonderful effect of peat-ashes on young clover may be explained on the same principle, and probably also that of gypsum. There can be no doubt, then, that considerable advantages may result from the operation of paring and burning the surface of clays. But what is lost and destroyed in the operation? All that escapes in the shape of gas or vapor. The gas will probably be carbonic acid; for this is formed by the combustion of charcoal. We know that hot lime has a very strong attraction for this substance, which it fixes in a solid state, becoming a carbonate of lime; and we have no reason to think that it parts with it to the roots of plants. But other earths may absorb carbonic acid, without having so great an attraction for it, and let it loose to water, with which it is known to combine in certain proportions, and to be thus carried into the vessels of growing plants by the attraction of the roots. If this should prove to be the case, we may account for the great effect of burnt sods in promoting vegetation.

The principal objection to burning is, that it destroys a great portion of vegetable matter. But this is a fact to be proved, and is perhaps rashly taken for granted. When vegetable matter decays in the earth, it loses much of its substance, which is converted into volatile matter, and flies off into the atmosphere. It is possible that thus more is lost during the time that the slow decay goes on, than even in burning with due precautions. This is a fact which may be difficult to ascertain; but it is not impossible; and therefore the assumption of the contrary requires to be founded on some proof or experiment. The earthy portion of the soil may be diminished by driving out the water which it held, as is manifest in burning clay, and it shrinks into a smaller space; but there is as much earthy substance as before, and this substance is improved by the burning. It appears, then, that a clay soil may be pared and burnt, without its real substance being diminished; and if its texture is improved, it becomes more fertile by the operation.

Burning clay soils is in fact something analogous to liming. Lime dissolves the vegetable matter, and enables its elements to enter into new combinations; but if no new vegetable matter be added to restore what is exhausted by vegetation, liming, as well as paring and burning, is detrimental in the end. Many experienced farmers pare and burn the soil on the edges of their ditches and on the banks on which the hedges grow, because they thereby exterminate many rank weeds; and the burnt earth mixed with farm-yard dung makes an admirable compost. Here the burnt earth acts as an absorbent, and no doubt attracts many of the volatile parts of the manure, which are produced by the decomposition of animal and vegetable matter in it. Paring and burning, therefore, should be joined to manuring, if a powerful and immediate effect is desired without exhausting the soil; and in this case we do not hesitate to recommend it on all cold clay soils where rank weeds are apt to spring up, and coarse grasses take the place of the better sorts which have been sown. The proper time to pare and burn is evidently after the land has lain in grass for several years, and is broken up for tillage. The surface should be pared thin; about two inches is the extreme thickness allowable for the sod if the soil is very stiff and poor, and as thin as possible in a better soil. It should be done with a breast-plow or paring-iron by manual labor. The sods should be moderately dried, and then arranged into small heaps with a hollow in the middle to hold heath or bushes to kindle the fire. When it has fairly established itself, all the apertures should be carefully closed. Wherever any smoke breaks out, a fresh sod should be immediately put over it; a heap containing a small cart-load of sods should be smouldering for several days without going out, even if it rains hard. If the fire is too brisk, the earth will form hard lumps, and even vitrify; but otherwise it comes out in the form of a fine powder, in which evident marks of charcoal appear. If this is of a fine red color, it is a good sign; for the iron in the earth has been converted into a peroxide, which is perfectly innocent in its effects on vegetation;

whereas all the saline impregnations of iron are more or less hurtful. It is better to burn the sods in large than in small heaps; for the more the fire is smothered, the better the ashes.

So great a quantity of ashes is sometimes produced as to admit of a portion being carried off on grass land, or used to manure another field for turnips. As this is evidently robbing the field where the operation has been carried on, an equivalent quantity of manure should be brought in exchange. Perhaps the most advantageous mode of using the ashes is to spread them in the drills where the turnip-seed is to be sown, after a portion of dung has been buried under them. In this manner the ashes from one acre of land pared and burnt, together with ten or twelve cart-loads of good yard dung, will manure two acres, and all the manure of one acre, in the ordinary mode of raising turnips on ridges, will be saved. If the ashes will produce as good turnips with half the usual quantity of dung, the expense of paring and burning is amply repaid. But experience proves that the earth and ashes almost ensure a good crop of turnips in many poor stiff soils in which they would probably not have succeeded if sown in the common course of cultivation without bones or ashes.

When a considerable extent of poor land is brought into cultivation, and there is no sufficient supply of manure at hand, paring and burning a portion of the land every year, by which a crop of turnips is obtained, is a most effectual means of improvement. Lime may be used at the same time with the ashes, and will increase their effect, provided some vegetable undecayed matter remains in the soil after paring; but lime will tend to exhaust this; and if, in consequence of liming, a few good crops of corn are obtained at first, the soil will be so exhausted as to be of little value afterwards. This is the abuse of the practice which has caused it to come into disrepute. It would be a great waste to burn the surface of a rich piece of grass land where the plants growing in it are tender and succulent, and would readily rot on being plowed under; in such case a moderate application of lime would have a much better effect. This kind of land will produce good crops without any manure, and continue fertile for many years if judiciously cultivated. To pare and burn rich land is wasteful, and can never be recommended. It is only on poor land which has not strength to produce a crop, and of which the texture requires to be improved and its powers stimulated, that paring and burning is advantageous; on poor, thin, chalky soils that have been laid down with sainfoin, of which the roots and stems are grown coarse and hard, so as not readily to rot in the ground, the operation is proper and advantageous. The turnips produced by the ashes, with or without the assistance of dung, must be fed off by sheep folded on the land, whose dung and urine will enrich it, and their tread consolidate it. By this mode of proceeding great advantages are obtained from paring and burning, and the land, so far from being deteriorated, will be improved.

Many landlords rigidly forbid their tenants to pare or burn any part of their land, from an idea that the heart of it is destroyed by the burning. If they would would only insist on a certain quantity of dung being put on, either at the same time that the land is thus treated, or for the next crop, and prohibit the sowing of corn crops except after turnips, clover, or some other green crop consumed on the farm, there would be little danger of any detriment to the land, even if it were pared and burnt once in every ten or twelve years, provided it were judiciously treated in the intervals. The farmer would be benefited in many situations, and the practice would tend to keep up the value of the farms.

In Devonshire, where the land has been pared and burnt from time immemorial, even where the soil is rich, the practice has been often resorted to without any judgment. Provided a crop of corn or potatoes was obtained at little cost, the consequences to the future state of the land were not heeded; and landlords, seeing their farms impoverished, put a stop to the practice. Thus many useful modes of cultivation have been reprobated from the abuse of them, which, properly applied, would have been advantageous to all parties. There is no maxim more true than this; that whatever injures the landlord, injures the farmer who is not desirous of removing, and *vice versâ*; and all restrictions on cultivation, however necessary when there is a fear of dishonest conduct, diminish the value of a farm and lessen the rent which can be fairly afforded for it. Ignorance is often a greater destroyer of the interest of both landlord and tenant than wilful dishonesty; and the spreading of useful information among tenants, so that they may see their own advantage, is the surest means of improving landed property. Many tracts of waste land might be brought into cultivation by means of paring and burning, which without it would never repay the labor required. Where the soil is inclined to peat, this operation and abundant liming are the indispensable preliminaries of cultivation. The ashes and the lime will produce vegetation and food for animals. These will produce dung to supply what the vegetation abstracts, and to assist also in the farther decomposition of the peaty matter, converting it into vegetable mould.

The first crop after paring and burning, as was observed before, should, if possible, be turnips, and these should be consumed on the spot; but there are exceptions to the rule. The soil may be a stiff clay of a considerable degree of natural fertility, only encumbered with rank weeds and grasses. In this case the surface is burnt to destroy these, and a crop of corn may safely be taken after the paring and burning, the land coming into a regular alternate rotation after it. For example, the next crop may be beans or tares, with a good proportion of dung; or clover may be sown with the first crop, if the ground appears fit for it. The effect of the ashes will be readily perceived in the luxuriance of the clover. Such land may be afterwards cultivated, according to its nature and quality, with the rest of the farm; or laid down to grass after a course of cleansing and ameliorating crops.—Thus old wet meadows, after having been well underdrained, may be greatly improved, and either converted into arable fields or laid down again with choice grasses.

Old rough pastures may often be greatly improved by a very thin paring and burning, so as not to destroy all the roots of the grass. When the ashes are spread over the pared surface, some good grass-seeds are sown with them. The whole is well harrowed or scarified and rolled, and the grass which will spring up after this will be greatly improved, and will fully repay the expense of this simple mode of renovating it. This is the cheapest mode of improving coarse pastures that we know, without breaking them up.

The partial paring and burning of the headlands of fields, for the purpose of mixing the ashes and burnt earth with dung in a compost, is a most excellent practice, and often superior to that of using the sods only, without burning them. These sods contain innumerable seeds of weeds, and eggs or maggots of insects, which are not destroyed by the fermentation of the heap, but, on the contrary, are brought to life. The loss of a portion of vegetable matter in the burning is amply compensated by the destruction of these enemies of the future crops.

It now only remains to take notice of the soils and situations where paring and burning cannot be recommended. Wherever the soil is very loose from a great proportion of silicious sand in its composition, and is held together chiefly by the slender roots which run through it, the burning would destroy the whole of the vegetable matter; for none of the volatile parts which the fire dissipates or generates would be retained or absorbed, but would pass through the loose sand in the same way that water would. Here then would be actual destruction; and the residue would be a mere barren silicious sand, much worse and more porous than it was when held together by the roots. The only way to bring such soils into cultivation is to put clay or marl on them, and to force vegetation by means of liquid manures, chiefly the urine of animals, consolidating them by every means applicable, so that they may retain moisture, and that the manure may not be washed through by the rains. Such soils may be improved, but they are the most ungrateful of any; and it is only necessity and indefatigable industry which can make them produce any crops.

It is very easy to ascertain whether any soil will be improved or not by paring and burning. A few sods may be taken and exposed to heat in an iron pot closely covered over, or in a large crucible: the heat should not be so great as to produce light, but should be kept up for a considerable time, till the sods are consumed. If the ashes are red, and the whole is a fine powder, with particles of charcoal in it, the soil from which it was taken may be safely pared and burnt, especially if it forms a mud with water, and the earth is not readily deposited. But if it feels gritty, lets the water readily through, and is soon deposited when mixed with it, burning will not be advantageous. This is the evident result of the principles laid down before.

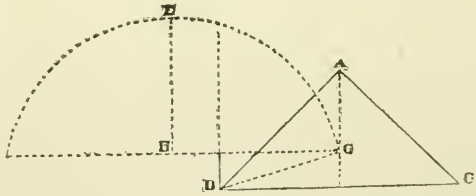
On the whole, the operation of paring and burning, when judiciously applied and properly performed, is a most excellent and cheap improvement of certain soils, and it will never diminish their fertility, if they are properly cultivated and manured, and a judicious succession of crops is adopted; but on the contrary it will improve their quality and texture, and make them more productive.

THE CENTRE OF GRAVITY.

We have heretofore alluded, but only incidentally and scarcely in a way to make ourselves understood, to the various studies which, (although the connexion is not at first apparent,) are yet necessary to the most efficient practice of the Agricultural art. Among these, the *general principle of Mechanics* should be esteemed as of the highest importance. We will suppose them to be inculcated in Common Schools, by means of lectures and illustrations, clear and simple as we find the following, for instance, in part of one of *Dr. Lardner's Lectures* on THE CENTRE OF GRAVITY; and who does not see how useful through life would be tuition of this sort:

When the line of direction falls within the base, bodies will always stand firm, but not with the same degree of stability. In general, the stability depends on the hight which the centre of gravity must be elevated before the body can be overthrown. The greater this hight is, the greater in the same proportion will be the stability.

Fig. 23.



Let B A C, fig. 23, be a pyramid, the centre of gravity being at G. To turn this over the edge B, the centre of gravity must be carried over the arch G E, and must therefore be raised through the hight H E. If, however, the pyramid were taller relatively to its base, as in fig. 24, the hight H E would be proportionally less; and if the base were very small in reference to the hight, as in fig. 25, the hight H E would be very small, and a slight force would throw it over the edge B.

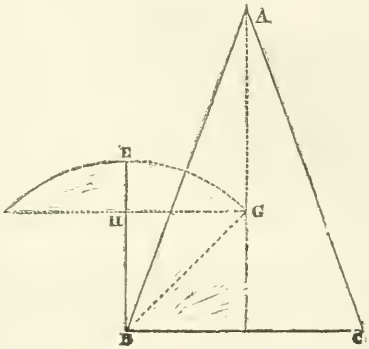
It is obvious that the same observations may be applied to all figures whatever, the conclusions just deduced depending only on the distance of the line of direction from the edge of the base, and the hight of the centre of gravity above it.

Hence we may perceive the principle on

which the stability of loaded carriages depends. When the load is placed at a considerable elevation above the wheels, the centre of gravity is elevated, and the carriage becomes proportionally insecure. In coaches for the conveyance of passengers, the luggage is therefore sometimes placed below the body of the coach; light parcels of large bulk may be placed on the top with impunity.

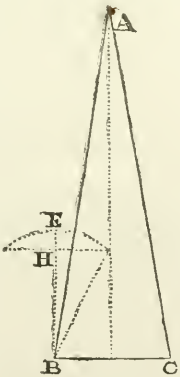
When the centre of gravity of a carriage is much elevated, there is considerable danger of overthrow, if a corner be turned sharply and with a rapid pace; for the centrifugal force then acting on the centre of gravity will easily raise

Fig. 24.



it through the small hight which is necessary to turn the carriage over the external wheels.

Fig. 25.



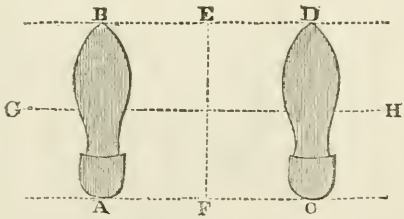
The same wagon will have greater stability when loaded with a heavy substance which occupies a small space, such as metal, than when it carries the same weight of a lighter substance, such as hay; because the centre of gravity in the latter case will be much more elevated.

If a large table be placed upon a single leg in its centre, it will be impracticable to make it stand firm; but if the pillar on which it rests terminate in a tripod, it will have the same stability as if it had three legs attached to the points directly over the places where the feet of the tripod rest.

When a solid body is supported by more points than one, it is not necessary for its stability that the line of direction should fall on one of those points. If there be only two points of support, the line direction must fall between them. The body is in this case supported as effectually as if it rested on an edge coinciding with a straight line drawn from one point of support to the other. If there be three points of support, which are not ranged in the same straight line, the body will be supported in the same manner as it would be by a base coinciding with the triangle formed by straight lines joining the three points of support. In the same manner, whatever be the number of points on which the body may rest, its virtual base will be found by supposing straight lines drawn, joining the several points successively. When the line of direction falls within this base, the body will always stand firm, and otherwise not. The degree of stability is determined in the same manner as if the base were a continued surface.

Necessity and experience teach an animal to adapt its postures and motions to the position of the centre of gravity of his body. When a man stands, the line of direction of his weight must fall within the base formed by his feet. If A B C D, fig. 26, be the feet, this base is the space A B C D. It is evident that the more his toes are turned outward, the more contracted the base

Fig. 26.



will be in the direction E F, and the more liable he will be to fall backward or forward.—Also the closer his feet are together, the more contracted the base will be in the direction G H, and the more liable he will be to fall toward either side.

When a man walks, the legs are alternately lifted from the ground, and the centre of gravi-

ty is either unsupported or thrown from one side to the other. The body is also thrown a little forward, in order that the tendency of the centre of gravity to fall in the direction of the toes may assist the muscular action in propelling the body. This forward inclination of the body increases with the speed of the motion.

But for the flexibility of the knee-joint, the labor of walking would be much greater than it is; for the centre of gravity would be more elevated by each step. The line of motion of the centre of gravity in walking is represented by fig. 27, and deviates but little from a regular horizontal line, so that the elevation of the centre of gravity is subject to very slight variation. But if there were no knee-joint, as when a man has wooden legs, the centre of gravity would move as in fig. 28, so that at each step the weight of the body would be lifted through a considerable hight, and therefore the labor of walking would be much increased.

Fig. 27.

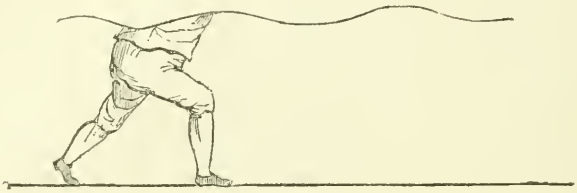


Fig. 28.

If a man stand on one leg, the line of direction of his weight must fall within the space on which his foot treads. The smallness of this space, compared with the hight of the centre of gravity, accounts for the difficulty of this feat.

The position of the centre of gravity of the body changes with the posture and position of the limbs. If the arm be extended from one side, the centre of gravity is brought nearer to that side than it was when the arm hung perpendicularly. When dancers, standing on one leg, extend the other at right angles to it, they must incline the body in the direction opposite to that in which the leg is extended, in order to bring the centre of gravity over the foot which supports them.

Fig. 29.

When a porter carries a load, his position must be regulated by the centre of gravity of his body and the load taken together. If he bore the load on his back, fig. 29, the line of direction would pass beyond his heels, and he would fall backward. To bring the centre of gravity over his feet, he accordingly leans forward, fig. 30.

If a nurse carry a child in her arms, she leans back for a like reason.

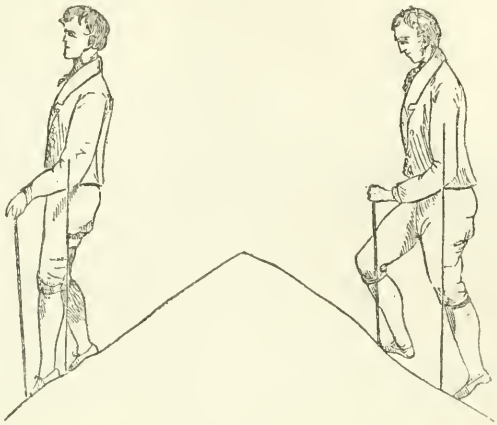
When a load is carried on the head, the bearer stands upright, that the centre of gravity may be over his feet. In ascending a hill, we appear to incline forward, and in descending, to lean backward; but in truth we are standing upright with respect to a level plane. This is necessary to keep the line of direction between the feet, as is evident from fig. 31.

Fig. 30.

A person sitting on a chair which has no back, cannot rise from it without either stooping forward to bring the centre of gravity over the feet, or drawing back the feet to bring them under the centre of gravity.

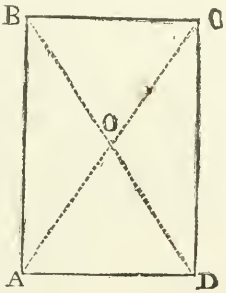
A quadruped never raises both feet on the same side simultaneously, for the centre of gravity would then be unsupported. Let A B C D, fig. 32, be the feet. The base on which it stands is A B C D, and the centre of gravity is nearly over the point O, where the diagonals cross each other. The legs A and C being raised together, the centre of gravity is supported by the legs B and D, since it falls between them; and when B and D are raised, it is, in like manner, supported by the feet A and C. The centre of gravity, however, is often unsupported for a moment; for the leg B is raised from the ground

Fig. 31.



before A comes to it, as is plain from observing the track of a horse's feet, the mark of A being upon or before that of B. In the more rapid paces of all animals the centre of gravity is at intervals unsupported.

Fig. 32.



The feats of rope-dancers are experiments on the management of the centre of gravity. The evolutions of the performer are found to be facilitated by holding in his hand a heavy pole. His security in this case depends, not on the centre of gravity of his body, but on that of his body and the pole taken together.—This point is near the centre of the pole, so that, in fact, he may be said to hold in his hands the point on the position of which the facility of his feats depends. Without the aid of the pole, the centre of gravity would be within the trunk of the body, and its position could not be adapted to circumstances with the same ease and rapidity.

The centre of gravity of a mass of fluid is that point which would have the properties which have been proved to belong to the centre of gravity of a solid, if the fluid were solidified without changing in any respect the quantity or arrangement of its parts.

IMPORTANT TO WOOL-GROWERS.

A REVIEW OF THE PAST, PRESENT, AND FUTURE STATE OF THE WOOL MARKET.

THE consumption of English Wool during the last twelve months has unquestionably been on a larger scale than at any former time. And during the last four or five months the heavy stocks held (in the latter half particularly) last year have been very greatly reduced, and have presented the contrast with last year, that, so far from the stocks of Wools of English growth being unusually large, they were probably never known to be so small. The effect which might have naturally been expected, from the small stocks of English Wools, has been counteracted by two prominent causes:—First, notwithstanding the extraordinary increase of the import of foreign Wools in 1844, that of the present year shows an increase over last year comparatively as great. And, second, some branches of trade in which English Wools are largely used, especially that of Bradford, have been exceptions to the general brisk and highly remunerative character of the generality of manufactures. As compared, therefore, with this time last year, we conclude the season with probably a smaller quantity of English Wool on hand, of former years' clip, than has existed for many years; while last year, at the same time, it was somewhat larger than usual.

By the accounts which we have this day published, in our "Monthly Supplement," of the quantities imported from the 5th January to the 5th May, we find the following comparison with respect to the imports of Wool:

Wool imported, Jan. 5 to May 5.

1843.	1844.	1845.
lbs.	lbs.	lbs.
7,273,118	10,800,430	14,529,273

This is the latest date for which we have any

accurate accounts for the whole kingdom; but from information, on which we can sufficiently rely for all practical purposes, the following month, up to the fifth of June, will show a still greater relative increase. The imports to the 5th of June may be thus stated:

1844.	1845.
lbs.	lbs.
14,650,430	19,705,593

Thus exhibiting an increase, even over the large imports of last year, of 5,000,000 lbs.

In looking, however, at this large increase, we are led to believe, after somewhat minute investigation, in the absence of any actual and authoritative account, that the largest portion of the increase is of Colonial Wools, and that in consequence of the shipments being much earlier than usual. There is no doubt we shall again, in the present year, receive an additional quantity from the Colonies, equal to their steady increase, but not in anything like the proportion which has already arrived, compared with last year. As far as our investigation goes, we are induced to believe that the import of European Wools in the present year has rather diminished than increased. While, therefore, we unquestionably have a smaller stock of home grown Wools, we have a larger one of those of foreign growth, though the latter may merely be in anticipation of shipments which arrived at a later period last year.

The re-shipment of Foreign Wools has also been on a smaller scale even than last year.

The whole of the quantity imported has been retained for consumption, except the trivial quantity of 275,325 lbs.

But the export of English Wools, however, shows a considerable increase in comparison with former years.

EXPORTS OF ENGLISH WOOL FROM JANUARY 5 TO MAY 5.

1843.	1844.	1845.
£92,966	£55,126	£152,491

So that, at an average of 15*d.* per lb., the quantity of English Wool exported to the 5th of May was equal to 1,639,856 lbs.

In forming an estimate of the supply of the future portion of the year, we will first advert to the circumstances which we think likely to affect the supply of home-grown Wools. There seems now to be no doubt entertained by any one that the clip of the present year will be considerably less than an average quantity.—The long and severe winter, and the great scarcity of fodder, no doubt operated to induce the farmers to send an unusually large quantity of sheep to market, so that the number yielding fleeces will be much fewer at this clip than in recent years. Moreover, there is no doubt that the same causes have operated in making the average weight of each fleece less than usual. In some parts of the country, especially in some of the counties south of London, this deficiency has been carefully estimated at *one-fifth;* but, taking the average of the whole county, and from both causes, the lowest estimate of deficiency is from *one-eighth* to *one-tenth.*

From inquiries which we have instituted, we much fear that similar causes will operate in every part of Europe to produce lighter fleeces, and, in all the popular districts, a considerable diminution of their number. We cannot doubt the diminution of the whole clip on the Continent will be at least equal to that in this country. We are, therefore, brought undeniably to these conclusions:—First, that not only in England, but also throughout the Continent, the stocks of old Wool were more closely worked up at the commencement of the present clip than in recent years; second, that the produce of the clip must be considerably less throughout Europe than in average years; and, third, that up to the present time the report of Colonial Wool shows a great increase on any former year; but it remains to be seen what portion of that increase is actually greater production, and what part merely earlier arrivals. These are all the accertained facts as to the present and future supply.

As far as regards the existing rate of consumption, we apprehend there can be no difference of opinion that it is in every department of trade greater than at any former period, and likely to continue so in every branch, unless the spinners at Bradford should be induced to lessen their produce, on account of the prices they obtain being barely remunerative. With regard to the consumption of the last three years, there is an important feature which every close observer connected with the trade must have seen, namely, that the consumption of each of these has been greater than the actual growth and import, and has been made up by the gradual use of the stocks which accumulated from 1839 to 1842; and it is certainly within the truth, if we say that the consumption of the three years—Midsummer 1842 to this time—has been equal to four years' growth; and that the present year, into which we are now entering, is the first in which we have to rely simply on the produce of the year for the supply of the year.

As far as regards our export trade of woolen manufactures, the present year, so far, exhibits a farther increase even upon last year, as shown by the following table:

WOOLEN YARN AND MANUFACTURES EXPORTED FROM JAN. 5 TO MAY 5.

	1843.	1844.	1845.
Yarn	£125,774	£210,439	£273,930
Manufactures	1 802,782	2,351,884	2,483,916
Total	£1,928,556	£2,562,323	£2,757,846

The present year is still in excess of last year, notwithstanding the large falling off to India, the United States, and some other important markets. We know of no good reason to apprehend any falling off during the rest of the year in this branch of the trade.

With regard to the home consumption, we have the best grounds for anticipating, not only a continuance of the late demand, but a considerable increase during the Autumn and Winter. There is no doubt the laboring population are now in a better state than they have been for a long time; and, as the railway projects come into activity during the Autumn and Winter, the quantity of employment will, with other branches, be greater than for many years past. We cannot, therefore, but anticipate a great increase in the home consumption of Wools, in common with all other goods and produce during the next year.

The considerations and facts which we have now adduced, as likely to affect the price of Wool, are strong in favor of its future prospects, inasmuch as stocks on hand are comparatively light, and the whole European supply will be considerably deficient, while the general consumption is likely not only to be sustained, but even increased, if not checked by too sudden a rise in price, which would be very prejudicial to all parties. [English Farmers' Magazine.

THE STATE FAIR AT UTICA

Came off according to appointment, and passed without rain, dust, or accident of any kind, to mar the satisfaction of any one of the many thousands every day in attendance, unless it be the slight chagrin which may have been felt by those who were disappointed in their sanguine expectations of bearing off prizes.

To suppose that some of these were not mortified, would be to presume a feeling of apathy unworthy of the occasion, and one which merits if it does not ensure the defeat of those who feel or affect it. But with men of true spirit, all disagreeable impressions, from such cause, are quickly brushed away, by the patriotic reflection, that what they esteemed good of their own, has been met by something better exhibited by a neighbor; thus showing that the general course of improvement is onward, and that victory in every department of rural industry is now only to be won by great exertion and great excellence.

Bearing in mind the comparatively high price of the Farmers' Library, yet not high in proportion to its volume and costliness of publication, its whole space must be economised and usefully appropriated. The question arises then how far it can be expected to embrace full accounts of all agricultural exhibitions, many of the particulars of which possess but a local interest, imparting only the fact, that particular premiums were awarded to A and B for best Sheep or Cattle, without conveying information of any new discovery or truth of general applicability and usefulness. Yet as *State* Fairs are open to competition from the whole commonwealth, and in this, and it may be in other States, materially assisted by State funds, it may be expected that a work designed for reference should record for that purpose the authentic results of such general competition.

As far, then, as at present advised, we have concluded that the proper course will be to journalize, from year to year, the distribution of prizes at the Annual Fair of the New-York State Agricultural Society, accompanied with such suggestions as may appear pertinent to the occasion, and likely to contribute to the true designs of the Institution.

We are much disposed to commit ourselves at once to the same course as to all *State* Exhibitions, to the end that the Farmers' Library may be looked to as an official repository of transactions at all these general displays of farming industry, reserving the privilege of such brief notices of the proceedings of local societies as may appear worthy of particular animadversion and subservient to the interests of Agriculture—and now, then, for the late Fair at Utica—extenuating nothing, nor setting down aught in wilful or unjust disparagement.

In the first place, it is to be observed that this was not the first, nor the second, but the *Fifth* Fair of a Society patronized by the State, and held only at intervals of one year. Five years have elapsed, then, within which to bring out improvement on improvement, in all the departments of State husbandry; within which to bring to light discoveries in compounding and using manures—in the trials of new staples and systems of rotation and cultivation—in the invention of new implements and machines to save labor, and to accomplish more perfect tillage—for all this would do more for the permanent benefit of Agriculture, than the mere *show* of animals, grains, vegetables, fruits and flowers. In the display of *these*, have competition and rewards been followed by general and marked improvement? In a word, the question is, did the exhibition which attracted an immense concourse of spectators, and which to all appearance gave so much satisfaction to the multitude, serve to elicit many new or important discoveries in agricultural economy, or, on the whole, to illustrate that progressive accession of knowledge and amelioration in the practice of the agricultural art, which every year ought to be expected to realize, among a sagacious and vigilant people.

As, in such cases, large contributions are expected to come from the county and town in which the Fair is held, it is but fair in this instance to bear in mind that *Oneida* is by far the most populous county in the State, except New-York, having now more than 100,000 inhabitants; yet, on the other hand, if the Census is to be trusted in any thing, there are counties which fall far behind it in population that exceed it as much in the number employed in Agriculture, as they do in their agricultural products. For example, while Lewis county is put down as having in 1840 a population of only 17,830, it is reported as having 17,629 Horses, or about one Horse for each person; 78,694 Neat Cattle; 165,390 Sheep, and 60,518 Swine; while Oneida with, at that time, 85,310 inhabitants, had but 7,604 Horses, 20,752 Neat Cattle, 40,531 Sheep,

and 20,344 Hogs. It seems clear, therefore, that this great county of 1,200 square miles, forming the summit level between the basins of the Hudson and the St. Lawrence, with the Mohawk rising in its centre and other springs that pour their waters from its bosom into Erie, Ontario, and the Susquehanna, makes no pretensions to *agricultural precedence*, and may, therefore, be excused for not sending to the Fair held at her capital, the proportion of good things, as will be more particularly seen by reference to the list of premiums awarded, that might otherwise have been expected.

Again, it is to be considered that the commendable and judicious liberality of the Railroad and Steamboat companies, in taking things free to and from the exhibition, corresponding in that respect with the practice in England, serves to place distant on a footing with proximate counties, and helps to account for the absence of that precedence which the very large and populous county of Oneida had been expected to claim and to make good.

To begin with the *Horse*—that most showy and popular, though not most useful of domestic animals:—the display of Stallions was large in proportion to that of other descriptions of Horses, as usually happens on such occasions, they generally appearing on the ground, as do some other characters, for electioneering purposes. Considering the apparent equality, to unpractised eyes, of several in the several classes for which premiums were offered, it was perhaps fortunate that the decision of the judges should have been, in all cases, unanimous. The public will thence infer that the grounds of preference must have been decisive, and perhaps the more readily acquiesce in the justice of the awards.

Their emphatic declaration, in their report, of the importance of *high breeding*, as the sheet anchor, that, if abandoned by the breeder, must lead to infinite degeneracy, ought and doubtless will have its happy effect; and nowhere, surely, is it more important to observe the true principles of breeding than in this State, which continues to levy immense contributions on the indolence and improvidence of some Southern States, who send as regularly to New-York, for all their fashionable Horses, as they do for their hats and their coats, their shoes and their shirts—yes! for in the upper part of this city there is a *steam engine* employed in giving the last finish of a plaited bosom to skirts for the southern cities.

"CONSTERNATION," a horse lately imported from England, to the consternation of some of his competitors, bore off the prize for the "best thorough-bred Stallion." He was said, by his owner, Mr. C. A. ALBOT, to measure 15 hands 3 inches, under the standard. He presents a forehand delicate and superb, and is of the highest finish throughout, without a particle of superfluous bone or beef about him. Thus much may we be allowed to say, though restrained from high commendation or criticism which might be bestowed on others, for want of time and space, even though it should not be deemed invidious. Being *the* premium Horse, we have reason to expect from the owner such facilities as will enable us to present to the patrons of the Farmers' Library his portrait and pedigree.

As to Neat Cattle, a most important department, one would think, in the estimation of farmers, who could make such a fine display of dairy products as was here exhibited; it did not present so great a number of new competitors as might have been anticipated. In this branch, the show would indeed have been a beggarly one of empty boxes, if the fine animals had been withheld, which had already been seen and admired at previous exhibitions, and which are in that way becoming as it were stereotyped in the public eye—of these it is true, thanks to their public spirited owners, we had perfect models of their breed of Short-Horns, Herefords, and Devons—and on all such occasions it is important to have models new or old, as standards which farmers should aspire to equal, and even to drive from the ground, by something yet a little superior. Not having time however, if we possessed the ability, to make observations in greater detail, such as we could hope would be profitable to the reader and the cause, it affords us much more pleasure to give place to the following more favorable impressions of those who were more competent if not more anxious observers. To the able and vigilant Editor of the Albany Evening Journal, who, we may presume, was on the ground, we are indebted as well for the following summary, as for all the particulars that will be given in the sequel:

"The exhibition of Stock was said by disinterested judges to be the best ever witnessed in New-York—and some even said the Union. It is an old saying, that what every body says must be true, and we do not, therefore, feel at liberty to gainsay the correctness of this claim.

"We find, by a statement in the Utica Gazette, that there were upon the ground, '48 Durham cattle, 11 Hereford, 9 Devon, 4 Ayreshire—72 in all of foreign breed, 37 native and cross, 21 native. 124 Oxen, 12 Steers and 8 fat cattle—making in all 274 horned cattle. Of Horses 114 in all, viz: 28 stallions, 36 matched, 7 geldings, 32 mares and colts, and 10 colts. Of Sheep there were 64 long wooled, 112 middle wooled, 58 Merinoes, 23 Saxons. To the above kinds adding 34 Swine, we have a grand total of 683 as the number of four footed beasts at the Cattle Show.' Taking it for granted that the live stock, in number and quality, exceeded those of previous years, and that there was a falling off in other particulars, it is not far from the right average to place this Fair on a par with its predecessors. It *should* have exceeded all.

"The address was delivered in the afternoon

by JOSIAH QUINCY, Jr. Esq. of Boston. As every body who knew the speaker anticipated, the effort was a noble one, and we doubt whether the addresses of any previous year, ever gave more univeral satisfaction."

What is said of the Address, is confirmed by the common opinion of those who heard it. We had not that good fortune, as the rostrum was in quite a different place from that which had been pointed out to us; and before we were apprised of the change, an immense jam of auditors made the Orator both inaccessible and inaudible from any point we could reach. Just enough could be seen to let us observe that he appeared to be master of himself and his subject, and to deliver his sentiments with not a little of that graceful and persuasive manner which reminded one of an anecdote related of the celebrated WHITFIELD, "the Paul of his sect," who was addressing a vast crowd of many thousands, when an old woman was seen on the confines of the multitude, far beyond the Orator's voice, to be in convulsions of admiration. A gentleman standing near, and lamenting the loss of what was stirring to their foundations the sensibilities of all around, said to her, "How is it, good woman, that you are so deeply moved at what you cannot hear?" "Ah! sir," said she, but *can you not see the godly wag of his head?*" In this case it was obvious that what the Orator was saying was greedily devoured by his auditors; and those who could not hear, like ourselves, departed with the next greatest pleasure—the expectation of reading the praises of Agriculture, now becoming fashionable, from so accomplished an amateur and one of good blood; for truly, if good predilections are hereditary, Mr. QUINCY ought to wish well to and take delight in it—as we remember about the time he graduated, to have been most kindly taken by the arm, on being presented to his venerable father, and at once marched through his *Vaccine Institution*, where at that time he had many *cow-boarders*, at, we believe, $40 a year for meat and lodging, with no view, that we could discern, but to illustrate practically the advantages and economy of his favorite *soiling system*. Among these lactiferous personages was the celebrated "*Oaks Cow*," of obscure, unpretending American ancestry, but whose prodigious contribution of 484 pounds of butter in eight months and a half, gave everlasting celebrity in dairy annals to the name of her owner, *Caleb Oaks*, and her Ladyship.

In the account of Premiums, made up from the *Albany Evening Journal*, we have omitted the *amounts* given in each case—the grade of merit forming the true question. Moreover, we confess that we could never be entirely reconciled to the practice of giving *money* premiums, instead of less sordid and more durable, even if they should be less costly memorials—such as, however small in money value, might yet be displayed with acknowledged and laudable pride in the old family cupboard or on the sideboard or the mantle, or treasured away among the household valuables as so many tangible trophies of honorable ambition and success; trophies to be transmitted from generation to generation as incentives to honorable emulation—heir-looms, by which our posterity may swear that their blood has *not* crept through drones, insensible and unambitious of distinction in any line of usefulness. In this feeling we should like, we must confess, to enjoy the consciousness of association with men who would value an old tea-spoon bearing a *mother's name*, and inscribed for best knitting or needle-work, more than any amount of greasy lucre won for a fat hog, and spent again on no one knows what.

By the bye, taking but a cursory view of the list of premiums, and doing homage to the good intentions and judgment of those who arranged the scale, some of them still strike us as not exactly just or expedient. For instance, much as we suppose was owing to the management of the *Housewife*, in gaining premiums for the products of the Dairy, the Garden, and various branches of Domestic Economy, only two or three Ladies took some small premiums, and only as many more were in any way noticed!—Would it not be well, seeing how much men are disposed to monopolize all honors and employments, that in all cases where excellence is found in articles produced chiefly under the eye and management of the good housewife, that the honor and the reward should be bestowed accordingly? For humanity's sake, society should be so organized, its industry so regulated, and its opinion so shaped, as that it should be deemed disreputable for any *man* to exercise employments to which a woman's strength is adequate, and which, in the view of a soundly constituted public judgment, she could perform with propriety. But on this subject we dare not trust ourselves.

Again: As to the scale of premiums, (and we desire not to be understood as applying our remarks to this occasion in particular, but only to take advantage of it for a general purpose,) is there any thing, let us ask, connected with the life and management of American Farmers, in which they expose themselves to more just censure, than in their neglect to provide for their table and family enjoyment the *various fruits in their season* which are known to be as conducive to health as they are congenial to our climate? Would anything better indicate that reform in our national taste so much to be coveted by all who have regard for national well-being, and even character, as the substitution of various fruits and vegetables, for the great joints of fat meat that load even to surfeit the tables

alike of the poor and the rich, the public and the private house. We do not mean exotics to be stimulated under glass or other costly process, and after all possessing neither the fragrance or sweetness that Nature yields to solicitation, never to force; but we call for, as due to the welfare and the reputation of every respectable Farmer, a full supply of choice plain fruits in their seasons, such as can be obtained by, and only by, the continued exercise of skill and close personal attention, and some study, from year to year; and are not these means within the reach and capacity of every industrious Farmer? and is not the object worthy of the highest stimulus of honor and reward *that a society can offer?* To the man who, according to his means, would set the best example in this respect, we would hold out the hope of an honorable name among farmers. He should be respected and esteemed and annalized as a social and moral reformer of the first order, who, by inducing all his neighbors to provide themselves with a full supply of apples, and pears, and peaches, and melons, and figs, and grapes, and plums, should therein teach them how to multiply the attractions and enjoyments, the virtues and the graces, of the homestead and the fireside. A carnivorous will always be accounted a sanguinary people; and he whose skill and good taste contribute to lead us to desert the butchers' shambles for the vegetable and the flower-market, acts the part and deserves the glory of the true patriot and friend of his country. It is he who would carry us back most nearly to that state of nature, of which it has been so beautifully written:—

> In the same temple, the resounding wood
> All vocal beings hymn'd their equal God,
> The shrine with gore unstain'd, with gold undrest,
> Unbrib'd, unbloody, stood the blameless Priest:
> Heaven's attribute was universal care,
> And man's prerogative to rule, but spare.

And yet look at the public taste so far as indicated, not by this list of premiums particularly, but by all such as are usually framed by Agricultural Societies. For the "*best Boar,*" $10, and for "*the greatest variety of table Pears,*" $3! and for "the best *twelve* kinds of Apples," $3! Yet look at the difference in the degree of intelligence and industrial habits which the production of these objects respectively employ!—The difference of skill, length of time and exactness of personal attention, and the presumption of intellectual refinement and taste in the two cases? It is not a little, in cases like this, in our humble opinion, that European Societies excel ours—we mean in the disposition of their funds. They offer high rewards for objects that at once indicate and demand a higher exercise of intellect, and which can only be the fruit of a more continued and enlightened study of subjects and sciences promotive of the art of Agriculture, and of a higher and wider range of rural enjoyment. They stimulate their scholars and talented writers and lecturers, by appropriation of a large portion of their funds, to go penetrate and labor in the regions of investigation and discovery, and to bring into view and practical exercise the philosophical principles that give labor-saving qualities to agricultural machinery, and a more scientific combination and efficient use to the various substances that serve o feed, sustain, improve and multiply their animals and their crops. And if these considerations have preponderating weight in forming the scale of premiums *there*, how much more should they have here, where labor is so much dearer and science not so much advanced? We will venture to affirm that a suitable premium or other inducement, that should prevail with such a man as Mr. Thomas or Mr. Downing, of this State, or Mr. Haggerston or Mr. McLellan, superintendents of the grounds of Mr. Cushing and Mr. Pratt, near Boston—to give for publication their experience in the culture and management of fruits and flowers—it would do more ulterior and permanent benefit to the State and the Country, than the public exhibition of *every fat bullock, and every fine gelding in the Union!*

But we are indulging in remarks that might perhaps better have place in a separate discussion. Certain it is that nothing is more deserving of thorough revisal and, as we humbly think, of reform, than the ordinary scales of Agricultural premiums, and the objects which the programmes put forth by Agricultural Societies should be framed to accomplish. In too many cases the funds are frittered away on things intended to form and to multiply attractions for the eye, and thus give transient eclat to a spectacle for gathering a crowd, which might be gathered as easily by a mule race or a show of monkeys. The fact is, we require too much to be done in this country for nothing. Men may work for nothing and find themselves for a short time, but that cannot be expected to be often repeated and yet have the work well done. To disburse the funds of a State Society, and to devise the best means of bringing into public view for the general use and common welfare that which would otherwise not be discovered, or be but partially known, is no trifling undertaking. It is a matter worthy of the deepest and most anxious study, and then to carry out the best system is a matter of much labor and detail, requiring the devotion of much time and personal attention—time, every moment of which is precious to men *equal to the duty;* time which, accordingly, ought to be *well paid for,* if we would have the work well done from year to year. But here again starts a train of reflection that we must at once cut short, even though we

have to recur to the subject on some future occasion, as we shall. After all, the suggestions which have almost insensibly escaped us, are not intended to have any particular or unkind bearing. No one can be more sensible than we to the kindness and efficiency of all who had control at the late Fair. We the better evince our impression of the importance of these exhibitions, and of having the funds at the command of the Society *most efficiently* administered, when we add that such consideration should be given as would command and liberally remunerate the time and talents of such men. Instead of looking on these exhibitions as a sort of holiday-fair, to which Farmers may go and carry their wives and daughters and sons, as to a militia mustering, let us for a moment elevate our contemplation to the real magnitude of the object, and consider that this New-York Agricultural Society is designed to represent the agricultural people and interests of a whole commonwealth, that now numbers near 3,000,000 of inhabitants, or nearly as many as fought for and achieved our Independence; and that its deliberations, and the use of the means at its command are intended to enlighten and to render more fruitful the labors of a great class, the annual produce of whose industry in 1840 is set down, on the highest statistical authority, Professor Tucker, at $108,275,241.

Is not *such an object* worthy of more liberal support from the State—such as would enable the Society to remunerate well a Board of Councilors of its best and wisest members?

We must not close these remarks, protracted as they are far beyond what we contemplated, without uniting in the expression of thanks which it may be taken for granted was unanimously voted by the Society to their accomplished President and his associate officers, under whose excellent management and with so much care and labor every thing was perfectly well arranged for the public accommodation.

Nor should we forget BAGG's excellent Hotel, the head quarters for the officers of the Society. Arriving with a great crowd in the night, we were most fortunate in getting such good quarters, and only hope we may never be *bagged* in a worse place.

PREMIUMS.

CATTLE.

CLASS I.—*Durham*,

THREE YEAR OLD BULLS.

1st..E. P. Prentice, 'O'Connell.'
2d..J. M. Sherwood, 'Arrow.'
3d..G. Vail, 'Symmetry.'

TWO YEAR OLD BULLS.

1st..Bell & Morris. Westchester, 'Marius.'

YEARLING BULLS.

1st..W. W. Bullard, Southport, 'Victor.'
2d..G. Brinkerhoff, Albany, 'Peter Parley.'
3d..H. N. Cary, Marcy, 'Oregon.'

BULL CALVES.

1st..Z. B. Wakeman, Herkimer, 'Meteor.'
2d..Bell & Morris, 'Prince.'

COWS, THREE YEARS OLD AND OVER.

1st..J. M. Sherwood, Auburn, 'Philopæan.'
2d..Bell & Morris, 'Victoria.'
3d..R. C. Nicholas, Geneva, 'Flora.'

TWO YEAR OLD HEIFERS.

1st..J. M. Sherwood, Auburn, 'Sybil.'
2d...H. N. Cary, Marcy, 'Lily.'

YEARLING HEIFERS.

1st..H. N. Cary, 'Rose.'
2d..J. M. Sherwood.

HEIFER CALVES.

1st..Z. B. Wakeman, Herkimer, 'Sylvia.'

CLASS II.—*Herefords*.

BULLS.

1st..E. Corning, 'Sir George.'

YOUNG BULLS.

1st..T. H. Hyatt, Rochester, 'Don Quixotte.'

COWS.

1st..E. Corning, 'Aston Beauty.'
2d.. do. 'Mary.'

HEIFERS.

1st..T. H. Hyatt, 'Emma.'

CLASS III.—*Devon Cattle*.

THREE YEAR BULLS.

1st..H. H. Washburn, Otsego, 'Young Baltimore.'
2d...E. P. Beck, Wyoming Co. 'Wm. Wallace.'

YOUNG BULLS.

1st..B. P. Johnson, Rome, 'Ivanhoe.'
2d..E. P. Beck, 'Criterion.'

COWS.

1st..E. P. Beck, 'Victoria.'
2d..H. N. Washburn, 'Rose of Baltimore.'

HEIFERS.

1st..H. N. Washburn, 'Utica.'
2d..E. P. Beck, 'Flora.'

CLASS IV.—*Ayreshire Bulls*.

1st..C. N. Bement, Albany, 'Sheltie.'

YOUNG BULLS.

1st..C. N. Bement, 'Kenwood.'

COWS.

1st..To same, 'Alice.'

HEIFERS.

1st..To same, 'Fairy.'

WORKING OXEN.

Best 10 yoke, J. S. & W. Wadsworth, Geneseo.
2d do. Russell Blackstone and others, N. Hartford.
Best yoke Abram Hurd.
2d do. J. S. & W. Wadsworth.
3d do. Luther Comstock. Kirkland.
4th od. H. N. Cary, Marcy.
5th do. E. Sheldon, Cayuga co.
6th do. A. D. Neal, New-Hartford.
7th do. S. B. Rhodes, Paris.

CLASS V.—*Grade Cattle*.

COWS.

1st..D. Skinner, Utica.
2d..H. N. Cary, Marcy.
3d..F. Ingersoll, Vernon.

TWO YEAR OLD HEIFERS.

1st...H. W. Doolittle, Herkimer.
2d..H. Crocker, Utica.
3d..J. B. Nott, Guilderland.

YEARLING HEIFERS.

1st..H. W. Doolittle.
2d..A. J. Bell, Westmoreland.

HEIFER CALVES.

1st..A. McBride, Marshall.

CLASS VI.—*Native Cattle*.

COWS.

1st..H. H. Eastman.
2d..F. D. Grosvenor, Utica.
3d..H. Waters, Earlville.

TWO YEAR OLD HEIFERS.

1st..H. H. Eastman.
2d..W. L. Mould, Paris.
3d..E. F. Head, Kirkland.

YEARLING HEIFERS.

1st..A. J. Bell.
Best heifer calf, G. W. Drew, Kirkland.

MISCELLANEOUS.

BULLS.

1st..H. Putnam, Rome.
2d..P. Budlong.
3d..L. Smith, Otsego.
4th..S. M. Foster, New-Hartford.
Best bull calf, George Goertner, Canajoharie.

STEERS—THREE YEARS OLD.

1st..Hiram Gridley, Kirkland.
2d..J. S. Wadsworth.
3d..R. Blackstone, New-Hartford.

TWO YEARS OLD.

1st..M. L. Butler, New-Hartford.
2d..S. Scovil, Marshall.
3d..B. T. Case, Bristol.

YEARLING.

1st..S. W. Gunn, Kirkland.

FAT CATTLE.

Best pair, Charles Godfrey, Geneva.
2d..James Callanan, New-Scotland.
3d..C. Boorom & Co. Buffalo.

SINGLE OX OR STEER.

1st..Hugh Crocker Utica.
2d..E. P. Prentice, Albany.

COW OR HEIFER.

1st..C. Boorom & Co.
2d..E. Corning, 'Gay.'
3d.. " 'Matchless.'

SHEEP.

CLASS I.—*Long Wooled.*

1st..J. McD. McIntyre.
2d..—— Huxford, Oneida.
3d..—— Rathbun, Otsego, for yearling Dishley buck.

Best 10 lambs, premium divided between G. Brinkerhoff, Albany, and —— Hollis, Otsego.
Best ewes, —— Bushart.
2d do. —— Rathbun.

CLASS II.—*Bucks.*

1st..J. McD. McIntyre, Albany.
2d..F. Easton, Mt. Morris.
3d..Z. B. Wakeman, Herkimer.

FIVE EWES.

1st..J. McD. McIntyre.
2d..J. M. Sherwood, Auburn.
3d..Z. B. Wakeman.

LAMBS.

Best five, J. McD. McIntyre.

CLASS III.—*Merinoes.*

Best buck, H. & J. Carpenter, Poughkeepsie.
2d..J. M. Sherwood.
3d..Reed Burrett, Tompkins County.

FIVE EWES.

1st..J. M. Sherwood.
2d..Israel Smith, De Ruyter.

LAMBS

Best five, J. M. Sherwood.

CLASS IV.—*Saxony.*

Best Buck, S. B. Crocker, Vernon.
2d do. S. W. Church, do.
3d do. S. B. Crocker, do.
Best five ewes, S. W. Church.
2d do. S. B. Crocker.
3d do. D. C. Barnes.
Best five lambs, L. T. Marshall.

Flocks of Sheep from other States.

To J. H. Chatterton, J. H. Blaksley, Nathaniel B. Smith and Stephen Atwood, all of Litchfield, Conn.

FAT SHEEP.

1st..John Reeves.
2d..J. McD. McIntyre.
3d..George Brinkerhoff, Albany.

STALLIONS.

THOROUGH BRED.

1st..C. P. Albot, Stokes, Oneida, 'Consternation.'
2d..N. S. Hungerford, Oneida, 'Sir Harry.'
3d..C. F. Crosby, Albany, 'Florizelle.'
4th..T. J. Thompson, Otsego, 'Sir Charles.'

HORSES OF ALL WORK.

1st..S. Panshur, Onon. 'Young Eclipse.'
2d..W. Ferguson, Oneida, 'Kentucky Hunter.'
3d..S. D. Moody, St. Lawrence, bay 'Blucher.'
4th..D. Merriam, Lewis, black 'Blucher.'

DRAUGHT STALLIONS.

1st..E. Corning, 'Sampson.'
2d..Jno. Van Hoesen, Oneida, 'Patriot.'
3d..G. Warren, Onondaga, 'Dragon.'
4th..B. Pettet, Oneida, 'Honest Tom.'

THREE YEAR OLD STALLIONS.

1st..L. Cones, Oneida, 'Black Messenger.'
2d..J. M. Tiffany, Chenango, 'Young Godolphin.'

DISCRETIONARY.

1st..Isaac Fairchild, Onondaga, 'Beppo.'
2d..M. Clark, Oneida, 'Sir Roderick.'
3d..G. B. Roe, Madison, 'Young Sir Charles.'

MATCHED HORSES AND GELDINGS.

MATCHED HORSES.

1st..Arden Merrill, Rome.
2d..J. Butterfield & Co. Utica.
3d..Lewis Joy, Trenton.
Five pair Cream Colored Horses, Welch & Mann.

GELDINGS.

1st..J. Butterfield & Co. Utica.
2d..A. Soles, Schenectady.
3d..G. W. Gardner, Utica.

MARES AND COLTS.

1st..George Gordon, Geneva.
2d..J. B. Nott.
3d..A. Close, Paris.

THREE YEAR OLDS.

1st..Isaac Fairchild, Fabius.
2d..W. C. Burrett, Paris.

TWO YEAR OLDS.

1st..George Gordon.
2d..I. Fairchild.
Pair of Arabian Colts, Roswell Morgan.
Yearling Mare Colts, J. B. Nott.

HOGS.

Best boar, of Leicester breed, C. R. Nicholas, Darien.
2d best, Berkshire, J. M. Sherwood.
3d do. Berkshire, —— Marshall.
Best breeding Sow, Berkshire and Leicestershire, J. J. Bushart, Montgomery Co.
2d do. R. Eells.
3d do. Peter Smith, Oneida County.
Best four pigs, R. Eells.
2d do. James Plant, Utica.

POULTRY.

Best Dorking fowls, L. Tucker.
" Black Polands, G. Bement.
" Pr. Ducks, (Muscovy,) G. Bement.
" Turkeys, (wild,) L. Tucker.
" Geese, (African,) G. Bement.
" Lot large fowls, (Ostrich,) do.
" and greatest variety, L. Tucker.

VEGETABLES.

12 best table Turnips, A. Brigham, State Lunatic Asylum.
12 best Carrots, G. S. Dann, Utica.
12 best table Beets, D. Gray, Jr., Marcy.
12 best Onions, C. F. Crossman, Rochester.
3 best Heads Cabbages, D. Gray, Jr.
12 best Tomatoes, do.

10 Egg Plants, and one Tree do. E. C. Goodrich, Utica.
Best half peck Lima Beans, A. Brigham, Asylum.
3 best Squashes, to same.
Best half peck table Potatoes, James Rees, New-Hartford.
2d do. Robert Eells, Westmoreland.
Best Seedling Potatoes, four specimens, half peck each, H. N. Langworthy, Irondequoit.
12 ears best Seed Corn, Charles W. Eells, Kirkland.
Potato Onions, J. Greenleaf, Brockport.
Samples Watermelons and Cantelopes, E. C. Goodrich, and for Watermelons to G. W. Cromwell.
Sweet Corn, E. C. Goodrich.
Greatest variety of Vegetables, to D. Gray.

FRUITS.

Greatest variety of Table Apples, Ellwanger & Barry, Rochester.
2d do. D. Thomas, Cayuga.
3d do. J. C. Hastings, Kirkland.
Best 12 sorts do. O. Phelps, Canandaigua.
Greatest variety Table Pears, D. Thomas, Cayuga.
2d do. Ellwanger & Barry.
Greatest variety of Winter Pears, D. Thomas.
Best 12 Quinces, O. Phelps.
Best 12 Peaches, N. Goodsell, Greece.
Best 24 Plums, H. Green, Utica.
Best 6 bunches Native Grapes, W. Mervine, Utica.
Best 6 bunches Foreign Grapes, S. D. Childs, Utica.

FLOWERS.

Greatest variety, —— Boies, Utica; 2d, —— Jackson, Schenectady; 3d, Ellwanger & Barry, Rochester.
Best Floral Ornament, —— Boies, Utica; 2d, —— Lyndes, Utica; 3d, Ellwanger & Barry.
Best Seedling Dahlias, —— Boies, Utica; best 25 varieties, —— Jackson, Schenectady; 12 varieties, do. H. Chedell; five varieties flowers, Mrs. Jackson, Utica. Commendatory notices were taken of the collections of Mrs. Hinman and Mrs. Childs, Utica.

BUTTER.

Best lot from five cows, E. R. Evans, Marshall.
2d do. Thomas Hawks, Herkimer.
3d do. George Vail, Troy.
Best 25 lbs. made in June—1st, R. S. Ransom, Perryville.
2d..C. C. Crocker, Union.
3d..—— Case, New-Hartford.
Best 50 lbs. made at any time—1st, C. Adams, Martinsburgh.
2d..S. M. Foster, Litchfield.
3d..O. Cole Litchfield.
4th..Daniel Eells, Jr. New.Hartford.
5th..Wm. Otley, Oaks Corners.

CHEESE.

Best Dairy to Herkimer County.
2d do. Oneida County.
Best Cheese, one year old and over—1st, Robert Eells, Westmoreland.
2d do. F. Ingersoll, Vernon.
Cheese less than one year old—1st, W. S. Ford, Salisbury.
2d..W. Otley, Oaks Corners.
3d..T. Hallenbeck, Herkimer County.
4th..N. Wilcox, Winfield.
5th..J. Smalley, Norway.

MAPLE SUGAR.

1st..Joel Woodworth, Watertown.
2d..Moses Eames, Rutland.
3d..W. E. White, Walton.
4th..E. Bigelow.
5th..Sidney Spring.

SILK—SEWING.

1st..Clark Avery, Perryville.
2d..D. Irish, do.
3d..J. Hutchinson, Riverhead.

RAW SILK.

1st..Mrs. Irish, Perryville.
2d..C. Avery, do.
3d..E. Blackburn, Vernon.

CORN AND COB CRUSHERS, &c.

Best Corn and Cob Crusher, worked by Horse Power—J. A. Fitts, Rochester.
Farm Horse Cart—W. Carroll, Albany.
Best Improved Revolving Horse Rake—G. White, Middlefield.
2d do. A Brockway, Bridgewater.
Improved Ox Yokes—1st, A. Monroe, Galway, 2d, Wm. Hill, Marcy.
Grain Cradles—1st, E. L. Hager, Frankfort; 2d, David Flanders, Stockholm.
Hay Forks—Taylor, Buttolph & Co. Stockholm.
Grass and Cradle Scythes—Hiram C. White, Albion.
Hoes—R. & E. Clark & Co. Unadilla Forks.
Corn Sheller—Joseph D. Briggs, Saratoga.
Corn Cutter—J. M. Cleveland, Adams.

FARM IMPLEMENTS.

Farm Wagons—1st, P. S. Eastman, New-Hartford; 2d, S. & M. Peckham, Utica.
Harrows—1st, Orin Barton, Geddes.
Scarifiers—1st, to same.
Cultivators—1st, to same.
Fanning Mills—1st. I. T. Grant, Schaghticoke; 2d, Clow & Crolin, Mentz; 3d, J. Patterson, Canandaigua.
Horse Power—1st. A. D. Childs, Rochester.
Threshing Machine—1st, A. Douglass, Skaneateles; 2d, Hart, Higham & Co. Utica; 3d, E. Hicks.
Drill Barrows, to plant potatoes or corn—Abner Randall, Oneida.
Straw Cutters—1st, J. G. Case, Utica; 2d, J. C. Rich, Penfield; 3d, M. Sanders, Cortland.

PLOWING MATCH.

Twenty competitors entered the field, and the awards were as follows:—1st, Frederick Smith, Westmoreland; 2d, Elon Comstock, Rome; 3d, Thomas B. Burrell, Geneva; 4th, O. R. Babcock, Bridgewater; 5th, H. N. Cary, Marcy; plowing by boy under 18 years of age, premium to E. W. Butler, Rome.

The Coming Fair of the American Institute.—In a late number, we invoked public attention to the Fair about to be held by the American Institute, and urged for it the contributions and support, in every form, which are due to the patriotic designs of the Institution.

It is on these occasions that we see concentrated the choice fruits of American Industry in all its branches. Here is presented an open and wide field for public spirited men to come forward and evince by *word* and deed their readiness to forward the march of improvement which is going on in all the arts, trades, and interests of our country, and those who go to acquire, should be willing to contribute to the stock of information; and assurance has been given, that the plainest and most unpretending, who have useful knowledge to impart, will be heard with as much respect as the most opulent and distinguished.

The Fair will commence at Niblo's Garden, on Monday the 6th of October, at 12 o'clock, as already advertised in the papers and in various forms.

Our Estimable Colleagues, the "American Farmer," and the "Agriculturist." "The Cultivator," the "Southern Planter and Southern Cultivator," and the "Farmers' Cabinet,"

with many others, for the last month, are rich far beyond their cost. We had intended to have glanced at their contents, and to have noticed Mr. Allen's excellent and well-timed Seed Store and Implement Ware-House, but the printer advises that there is not room for many things already in type.

☞ Lowood is welcomed to a place in the Library, and we hope he will often occupy it, but his communication was too late for this number.

Important Motion in Parliament.—Mr. Escott made a specific motion for a repeal of the duties on Indian Corn, early next session, but the Anti-Repealers have taken the alarm and are appealing to the prejudices of the people, saying that Maize is food only for hogs in this country, are Englishment to eat what the Americans give their hogs!! We rejoice that a wedge has been entered. Doctor Bartlett's strong pamphlet is beginning to tell. We will give early attention to the subject, and shall write to our friend and Minister there—Hon. Louis McLane, who will not be neglectful of any opportunity to advance interests to which he has ever been personally so much devoted. In the meantime we wish our Agricultural Societies would invite Mr. Escott to come over and bring one of his most conspicuous opponents, to judge for themselves. We should like to catch them at the breakfast table of an accomplished Virginia housewife, of the old school, and see whether Maize bread in its half dozen various and delicious forms is worthy of the reproach which his opponents cast upon it. It was the standing every-day bread, at his dinner, of a certain American General, who captured Cornwallis and his army at Yorktown—any how!

PRICES CURRENT.

[*Corrected, September 23, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort	₱ 100 lb.	3 99¾	@— —
Pearls, 1st sort, '45		4 25	@— —
BEESWAX—American Yellow		— —	@— 29½
CANDLES—Mould, Tallow	₱ lb.	— 9	@— 11
Sperm, Eastern and City		— 27	@— 29
COTTON—From		— 6	@— 9¾
COTTON BAGGING—American		— 12	@— 13
CORDAGE—American	@ lb.	— 11	@— 12
DOMESTIC GOODS—Shirtings	₱ y.	— 5	@— 11
Sheetings		— 6½	@— 15
FEATHERS—American, live		— 30	@— 33
FLAX—American		— —	@— 7½
FLOUR & MEAL—Genesee	₱ bbl.	4 68¾	@ 4 75
Troy		4 68¾	@— —
Michigan		4 62½	@ 4 68¾
Ohio, flat hoop		4 62½	@ 4 68¾
Ohio, Heywood & Venice		5 12½	@ 5 25
Ohio, via New-Orleans		— —	@— —
Pennsylvania		— —	@ 4 75
Brandywine		4 75	@ 4 87½
Georgetown		4 75	@ 4 87½
Baltimore City Mills		4 62½	@ 4 75
Richmond City Mills		5 75	@ 5 87½
Richmond Country		4 62½	@ 4 75
Alexandria, Petersburg, &c		4 62½	@ 4 75
Rye Flour		3 12½	@ 3 37½
Corn Meal, Jersey and Brand		2 50	@ 2 75
Corn Meal, Brandywine	hhd.	11 87½	@12 —
GRAIN—Wheat, Western	₱ bush.	— 85	@ 1 —
Wheat, Southern	new	— 85	@ 1 —
Rye, Northern		— 68	@— —
Corn, Jersey and North	(meas.)	— 56	@— —
Corn Southern	(measure)	— 53	@— —
Corn, Southern	(weight)	— 53	@— —
Oats, Northern		— 42	@— —
Oats, Southern		— 35	@— 38½
HAY—North River	bales	— 70	@— 75
HEMP—American, dew-rotted	ton	85	—@ 95 —
" " water-rotted		125	—@175 —
HOPS—1st sort, 1845		— 12½	@— 15
IRON—American Pig, No. 1		30	— @35 —
" Common		27 50	@30 —
LIME—Thomaston	₱ obl.	— 95	@ 1 —
LUMBER—Boards, N.R.	₱ M. ft. clr.	35	— @40 —
Boards, Eastern Pine		10	— @11 —
Boards, Albany Pine	₱ pce.	— 8	@— 18
Plank, Georgia Pine	₱ M. ft.	33	— @40 —
Staves, White Oak, pipe		45	— @— —
Staves, White Oak, hhd		37	— @— —
Staves, White Oak, bbl		28	— @— —
Staves, Red Oak, hhd		27	— @28 —
Hoops		25	— @30 —
Scantling, Pine, Eastern		14	— @16 25
Scantling, Oak		30	— @35 —
Timber, Oak	₱ cubic foot	— 25	@— 37
Timber, White Pine		— 18	@— 25
Timber, Georgia Yellow Pine		— 35	@— 40
Shingles, 18 in	₱ bunch	1 75	@ 2 —
Shingles, Cedar, 3 feet, 1st quality		— —	@24 —
Shingles, Cedar, 3 feet, 2d quality		20 —	@22 —
Shingles, Cedar, 2 feet, 1st quality		— —	@17 50
Shingles, Cedar, 2 feet, 2d quality		15 —	@16 —
Shingles, Cypress, 2 feet		11 —	@13 —
Shingles, Company		— —	@29 —
MUSTARD—American		— 16	@— 31
NAILS—Wrought, 6d to 20d	₱ lb.	— 10	@— 12½
Cut, 4d to 40d		— 4	@— 4½
PLASTER PARIS	₱ ton	2 50	@ 2 62½
PROVISIONS—Beef, Mess,	₱ bbl.	8 75	@ 9 —
Beef, Prime,		5 —	@— —
Pork, Mess, Ohio, old and new		13 50	@14 —
Pork, Prime, Ohio, old and new		10 50	@11 —
Lard, Ohio	₱ lb.	— 7¼	@— 8½
Hams, Pickled		— 7	@— 7½
Shoulders, Pickled		— 5½	@— 5¾
Sides, Pickled		— —	@— —
Beef, Smoked	₱ lb.	— 8	@— 8½
Butter, Orange County		— 18	@— 22
Butter, Western Dairy		— 15	@— 16
Butter, ordinary		— 12	@— 13
Cheese, in casks and boxes		— 6½	@— 7½
SEEDS—Clover	₱ lb.	— 8	@— 9
Timothy	₱ tierce	12 —	@16 —
Flax, Rough		— —	@— —
SOAP—N. York, Brown	₱ lb.	— 3½	@— 5½
TALLOW—American, Rendered		— 7½	@— 7¾
TOBACCO—Virginia	@ lb.	— 3	@— 6
North Carolina		— 3	@— 5
Kentucky and Missouri		— 3	@— 7
WOOL—Am. Saxony, Fleece,	₱ lb.	— 35	@— 37½
American, Full Blood Merino		— 30	@— 33
American ½ and ¾ Merino		— 26	@— 28
American Native and ¼ Merino		— 24	@— 25
Superfine, Pulled		— 30	@— 31

Richard Peters.

MONTHLY

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MEMOIR OF JUDGE PETERS,

FOUNDER AND PRESIDENT OF THE PENNSYLVANIA AGRICULTURAL SOCIETY.

It was the purpose of the Editor of the Farmers' Library, to insert a Biography of Honorable Richard Peters, whose Portrait accompanies this number. The work was commenced, when "*An Address delivered before the Blockley and Merion Agricultural Society, on the 20th of September*, 1828, *by Hon. Samuel Breck, Vice President of the Society*," was handed to him. Mr. Breck was the constant associate and intimate friend of Judge Peters, for many years; and in this address he has, with the eloquence of friendship and the truth of history, exhibited the life, character, and political, judicial and agricultural services of his friend.

The Editor is much gratified to insert the Address of Mr. Breck, as he is well persuaded it contains a faithful representation of the distinguished person who is the subject of it, and that it will be acceptable to the patrons of this journal.

Judge Peters, it is well known, like many other writers on Agriculture, pretended to no distinction as a *practical farmer*; neither, we believe, did Arthur Young, or Sir John Sinclair, or Mr. Jefferson, who took the lead in illustrating the philosophical principles involved in the mould-board of a plow; or his son-in-law, Gov. Randolph, inventor of the hill-side plow. Neither was Mr. Madison or Nicholas Biddle, authors of the most beautiful and the soundest essays on Agriculture to be found in our language, entitled to rank among what are called *practical men!* The fact is that, if progress in agricultural and philosophical improvements, which are turned to account by your exclusively "practical men," were to be stayed in its course, depending on them for its impetus, the march of improvement would be a halting one—if, indeed, it did not come to a dead halt!

The valuable labors of Judge Peters in stimulating inquiry, forming associations, and diffusing a knowledge of facts, constituted exactly that sort of service which is apt to be availed of, while its author is forgotten, or remembered only in what was enthusiastic or visionary; whereas such men are entitled to praise, were it only for their amiable and patriotic intentions. But we gladly leave the Judge's merits to be memorialized by his friend. We had looked for this memoir to a quarter whence, though it might have come with more minuteness and equal truth, yet not with more impartial sincerity, than from the friend who, evidently, spoke in the fullness of the heart.

By the bye, we have ever admired that cordial manner of bearing witness to the merits of the dead, which prevails, as far as we know, most particularly in France, where the survivors, in the spirit of truth, and the solemnity of the grave-scene, lay their hands on the lid of the coffin, and attest, in the presence of God and his angels, to the virtues of their deceased friend! How much more genuine and impressive than obituary eulogies, prepared professional, and sometimes *paid for!*

Ours is no freshly-awakened sensibility to the influence of Judge Peters's writings on the landed interest of the country, for we find in the American Farmer of the 4th of June, 1819, an editorial notice of him and of Col. John Taylor, of Caroline, Virginia, as two gentlemen "highly distinguished in the various walks of learning and public usefulness—whose services in the cause of the plow have done more real benefit to the country than one-half of the politicians in it." So we still think; but we may add that there was this difference between them—that, while Col. Taylor's writings were often involved —sometimes obscuring his meaning—*he* was an

eminently successful practical farmer. He exemplified his precepts in a career of great success in the field.

Gentlemen: I may be excused, I hope, for offering of my own accord, to address you on the recent loss of our President. As the second officer in the Society, it becomes, in some measure, my duty, to notice the melancholy event. That eminent and worthy man—so well known to us—so much beloved by us; who, for forty years has so usefully and affectionately associated with us, has, at a good old age, paid the debt of Nature.

Death, perhaps, at no time strikes a victim, however obscure, who does not leave some sorrowing surviver; none so destitute of friends, as to descend to the grave wholly unlamented. How deeply, then, should we mourn the loss of a man so remarkably distinguished as the late President of this Society.

Upon an occasion so solemn, and to us so afflictive, we ought not to be satisfied with an ordinary notice: it is fit that we should dwell, somewhat at length, on the prominent passages of such a man's life; that we should recall to our minds the deeds of patriotism, of public spirit, and general usefulness, which have marked his lengthened career. This I shall attempt; and, howsoever imperfectly, I beg you to indulge me with a hearing.

Richard Peters, who died on the 22d of August, at his residence in Blockley, was born in the month of June, 1744, in the same house in which he expired; and had, consequently, passed, by a few months, the great age of eighty-four. He received his education in the city of Philadelphia; and, on entering the active scenes of life, was a good Latin and Greek scholar, and possessed a knowledge of the French and German languages.

Having adopted the law as a profession, his acquaintance with the German greatly facilitated his country practice; while his intuitive smartness, and steady industry, placed him in the front rank of the young practitioners of the day. He had an uncle who was Secretary of the Colonial Government, and whose office was, as I think, connected with the land department. This uncle was fond of young Peters, and occasionally charged him with a part of the duties of his office. It was here, no doubt, that he became familiar with the land-titles of the province, and laid the foundation of the reputation he acquired in after times, of possessing an intimate knowledge of the land-laws of the commonwealth. These avocations, however, were transient, and did not cause any relaxation in his professional pursuits; on the contrary, they were made the means of extending his acquaintance with influential men in the interior of the colony, and enabled him to follow, very profitably, the Courts of Justice, into all the surrounding counties, where his fluent conversation in German, extensive knowledge of the provincial grants and kindred laws, brought him into practice, and in due time competently rewarded his labors.

On those circuits, he was accustomed to display his unrivaled wit. The playfulness of his conversation, always enlivened by flashes of the gayest pleasantry, was forever quick and unrestrained, and varied by casts of true humor; sometimes as broad and well enacted as the most exaggerated farce, and at others convolved in double meaning, fitted only for the ready perception of the most practiced ear and polished taste. Thus distinguished, our young friend became a favorite with all classes.

It was about the time when this brilliant talent was already conspicuous: a talent that never after forsook him, even whilst age was wasting his tottering frame: it was at this period of youthful buoyancy, that a conference was held with the Indians of the Six Nations, at Fort Stanwix, in the province of New-York. Our lamented friend accompanied the delegation from Pennsylvania. During the negotiation of the treaty, he insinuated himself so much into the good graces of the Indian chiefs, and became so entirely acceptable to them, by his light-hearted jests, and sportive behavior, that even these sedate red men relaxed their rigid carriage, and unbending for a moment the usual severity of their characters, proposed to adopt him into their tribes. The offer was accepted, and Mr. Peters was formally introduced to his new relations, receiving from them, in allusion to his amusing talkativeness, the appropriate name of *Tegohtias*, which means *Paroquet*.

He used to say, that these Indians called the great William Penn *Onas*, the name of quill, or pen, in their language; whereas, added he, on my adoption, they have been more complimental, for they have given me the name of the bird and all his quills into the bargain.

Political difficulties with the mother country, now compelled every man to choose his side. Mr. Peters, although rather intimately associated with the proprietary government, which was chiefly royal in its feelings, did not hesitate to separate himself from it, and join the cause of his native country. While many influential members of the bar went over to the king, he stepped forward with zeal in defence of American rights.

Pennsylvania was, in that early day, without a militia. The peaceful descendants of Penn, and of his non-resistant companions, to whose excellent rule and exemplary conduct, this State is so much indebted for its rapid growth and present prosperity, had managed its affairs, even with the fierce aborigines, for nearly a century, without military aid, or any restraint whatever, other than the authority of mild and prudent laws, upheld as much by the probity, philanthropy, and unblemished demeanor of the law-givers, as by any penal provisions contained in the statutes themselves.

But those quiet times were about to be disturbed. Impolitic and unjust notions respecting this country, had got possession of the minds of the British ministry, which led them to adopt a system destructive of our rights and liberties. The cabinet—the parliament—the press of Great Britain, at that time, misunderstood the mutual interests of the two countries, pretty much as they have ever continued to do from that day to this. "Having their ears full of pride and airy fame," they treated us with "scurril jests, and matched us in comparisons with dirt, to weaken and discredit our expostulations." The colonial disputes were pushed to extremity. It became necessary to arm. Mr. Peters volunteered with his neighbors, and when they assembled for the purpose of organization, he was chosen their captain. His military career, however, was short. A mind so gifted, studies so essentially fitted for the civil departments of government, as those of Mr. Peters, soon removed him from the camp to the cabinet. Congress placed him at the Board of War, where his services for

many years, during the struggle for independence, have been acknowledged by a solemn vote of thanks by that illustrious body; services that can have been only properly appreciated by those who knew, like his fellow-laborers, the destitute state of the country, and consequent difficulties in the execution of his duty as adjunct war minister.

Who among us that has associated with our late venerable friend, has not often heard him advert to that gloomy period of our history, in language of trepidation and doubt! At one time the army was without powder, at another, lead; and always food or clothing was wanting. These were daily requisitions, to which no other answer oftentimes could be given, than that the public stores were empty. To illustrate the naked state of our magazines, and mental anguish of our public functionaries at that critical time, I will give you, very nearly in the words of Mr. Peters, a revolutionary anecdote, which I thought sufficiently curious to note in writing, on the 9th of November, 1823—the day that it was told to me by him.

"I was Commissioner of War," he said, "in 1779. General Washington wrote to me that all his powder was wet, and that he was entirely without lead or balls; so that should the enemy approach him, he must retreat. When I received this letter, I was going to a grand gala at the Spanish ambassador's, who lived in Mr. Chew's fine house in South Third-street. The spacious gardens were superbly decorated with variegated lamps: the edifice itself was a blaze of light; the show was splendid; but my feelings were far from being in harmony with all this brilliancy. I met at this party my friend Robert Morris, who soon discovered the state of my mind. 'You are not yourself to-night, Peters; what's the matter?' asked Morris. Notwithstanding my unlimited confidence in that great patriot, it was some time before I could prevail upon myself to disclose the cause of my depression; but at length I ventured to give him a hint of my inability to answer the pressing calls of the Commander-in-chief. 'The army is without lead, and I know not where to get an ounce to supply it: the General must retreat for want of ammunition.' 'Well, let him retreat,' replied the high and liberal-minded Morris: 'but cheer up: there are in the Holkar privateer, just arrived, ninety tons of lead, one half of which is mine, and at your service; the residue you can get by applying to Blair M'Clanaghan, and Holkar, both of whom are in the house with us.'

I accepted the offer from Mr. Morris, said Mr. Commissioner Peters, with many thanks, and addressed myself immediately to the two gentlemen who owned the other half, for their consent to sell; but they had already trusted a large amount of clothing to the continental Congress, and were unwilling to give that body any farther credit. I informed Morris of their refusal. 'Tell them,' said he, 'that I will pay them for their share.' This settled the business; the lead was delivered: I set three or four hundred men to work, who manufactured it into cartridge bullets for Washington's army, to which it gave complete relief."

The sequel of this anecdote shows that the supply was entirely accidental. The Holkar privateer was at Martinico, preparing to return home, when her Captain, Matthew Lawler, who is still living, had this lead offered to him for ballast. Uncertain, however, whether the market would not be overstocked by arrivals from Europe, he at first rejected it; but after some persuasion received it on board. What thanks do we not owe to such men! Peters, watchful, diligent, devoted—toils unceasingly for his country's good; Morris, generous to prodigality, ventures his all in the holy cause! Happily for America, such noble-spirited citizens were numerous in those days. Providence seemed to have enriched the land with them in every section. As they pass from us, it is assuredly due to their memory, to dwell for a moment on the mighty debt of gratitude we owe them.

Some other passages in the life of the celebrated subject of this memoir, may appositely be placed here, as having particular reference to the post occupied by him during the greater part of the revolutionary war.

On the 18th of June, 1778, Mr. Peters entered Philadelphia, at the very time the enemy was evacuating the place. He went there under a strong escort sent with him by General Washington. His object was to secure clothing and stores, secreted by our friends, who had remained in the city; and to purchase every thing he could from the dealers. The British rear-guard was crossing the Delaware, when he arrived. He succeeded in fulfilling the wishes of the American General-in-chief. Arnold took command of the city a few days after, while Mr. Peters returned to York in this State, where Congress then held its sessions.

"I left," says Mr. Peters, (in a letter to a friend,) "fifty thousand dollars to the order of Arnold, for the payment of the clothing and stores. The traitor seized those articles, and never paid for them, but converted the greater part of the money to his own use: among others, to buy the country-seat of Mr. M'Pherson, on the Schuylkill. Colonel Pickering and I detected him in ordering stores and provisions out of the public magazines, to fit out privateers of his own, and for his extravagant family establishment. An attempt to stop this robbery, produced between me and Arnold an open quarrel. I did not conceal but wrote to head-quarters my want of confidence in Arnold. When his traitorous conduct at West-Point became public, neither Colonel Pickering nor myself were the least surprised at it. He was placed in that command, at the solicitous request of some respectable New-Yorkers, who knew only his military character, which I always deemed overrated far beyond its real merit."

Mr. Peters's exertions became peculiarly meritorious and useful, at the time when General Washington suddenly changed his intended attack on New-York, to that of Yorktown in Virginia. We all know that this movement closed the war. De Grasse, with his fleet, offered to coöperate to the south, provided the American army could be immediately put in motion, to act in concert with the fleet. His cruise off the Chesapeake, he said, would be short; and whatever the land forces intended to do, must be done quickly. At this crisis, there were no battering cannon ready; no means of transporting the army, which lay at Morristown in New-Jersey; no money in the national treasury or military chest. Let the plan of relief be told in Mr. Peters's own words, as extracted from a letter to General Harrison, of the date of 12th of January, 1818.

"In the journals of Congress of July, 1781," says Mr. Peters, "a member of the Board of War was directed to repair to head-quarters, with Robert Morris, superintendent of finance,

and consult with the Commander-in-chief, on the subjects therein mentioned. The member of the board was myself.

"To show the prostrate situation of our pecuniary concerns, I mention that I had not in the chest of the office, without interfering with the daily common demands for contingencies, a sufficient sum for my outfit and personal expenses. Not foreseeing any extra claims for casualties, I had not provided out of my own funds against them. At Trenton, on our way to camp, I lost a horse. I could have ordered one out of the quarter-master's stables; but I avoided the example, knowing the low state of that department. I was obliged to borrow of Mr. Morris the money necessary to replace my loss. On our arrival at head-quarters, we had frequent conferences with the General. I was soon confirmed, in what I had before been convinced of, that our success, in the contemplated attack on New-York, was far worse than doubtful; and *that* was the plan of the campaign, notwithstanding historical representations to the contrary. Among them, I see recently published, 'a *project* of Comte *Rochambeau*,' announcing his having, a long time precedently, formed a deliberate plan for the fortunate achievement which closed our war. And yet I *know* that the change of the plan at first fixed on for the campaign, was sudden and accidental. All our conferences were predicated on measures solely relating to the intended attack on New-York."

The change of the plan originated with Washington alone: but let Mr. Peters's own words be again used: "One morning at the beat of reveillé, Mr. Morris and myself, who occupied the same marquee, were roused by a messenger from head-quarters, and desired forthwith to repair thither. We were surprised at the circumstance; every thing having been the evening before perfectly tranquil. We were more so on our meeting the General, who, the moment he saw me, with expressions of intemperate passion, (which I will not repeat,) handed to me a letter from the French admiral, who commanded six or seven ships at Rhode Island: 'Here,' said the General, 'read this; you understand the French;'—then turning away: 'so do I now better than ever.' Mr. Morris and myself stood silent, and not a little astonished. The letter informed the General that the writer had received by an express frigate, arrived from the fleet of Comte de Grasse, *at sea*, orders to join that fleet in the Chesapeake, as the *Comte* had changed his destination, on information that the bay of New-York was dangerous for his heavy ships; and if any thing could be done in the southern quarters, coöperation was offered during the few weeks of his intended stay in those waters, to avoid the West India hurricane season. Secrecy was enjoined, and we went our way. On returning to breakfast, we found the General as composed as if nothing extraordinary had happened, and measures concocting for the emergency. I had often admired these conquests over himself. That evening, or I think the next day, a letter arrived from the Marquis de Lafayette, from Virginia, announcing the arrival of the French fleet in the Chesapeake. I have seen it asserted, that this was the first intimation, and *an appearance* of a preconcerted plan was given to it at *camp*. This is another inaccurate *historical* fact.

"In the course of the day, I was asked by the General: 'well, what can you do for us, *under the present change of circumstances?*' I answered, 'please to inform me of the extent of your wants.' Being, after some time, so informed, *generally*, I replied: 'I can do every thing with money: nothing without it; but what can be transported hence must be relied on.' I looked impressively on Mr. Morris, who said, 'I understand you; I must have time to consider and calculate.'"

Mr. Morris shortly after told the general that he had no tangible effects; but if anticipations on the credit of his personal engagements would succeed, he could supply the means for transporting the army from New-Jersey to the Chesapeake.

"In a day or two," continues Mr. Peters, "we left camp, under injunctions of secrecy, (which we faithfully observed,) until the general developed his final objects and measures to Congress.

"On our arrival at Philadelphia, I set to work most industriously, and masked the object for a time. By the zeal and extraordinary efforts of the staff departments, particularly that of ordnance and military stores, sixty pieces of battering cannon, and a greater number of field artillery, were completely provided and finished in three or four weeks, and as any portion of the train was ready, sent off on its way to the southern enterprise. Not a single gun was mounted on my arrival at Philadelphia, nor a rammer or a sponge, or other *attirail*, nor any considerable quantity of fixed ammunition. No European magazine or arsenal could have done more in the time, and under like circumstances. General Knox, who arrived in twelve or fourteen days, had a great share of the merit of this effort. Mr. Morris supplied the *money* or the *credit*; and without derogation from the merit of the assistance rendered by State authorities, it may truly be said, that the financial means furnished by him were the main springs of transportation and supplies for the glorious achievement which effectually secured our independence. He issued his *notes* for, I think, one million four hundred thousand dollars. They passed freely, and at the value of specie, and were in time all redeemed. The *Bank of North America*, which he founded, with money supplied from abroad, and by taxing the credit of his particular friends, and many other good friends to their country, assisted him most eminently. We gave our securities to the amount of a great proportion of its capital stock. My bond was returned to me only a few days ago; amounting, as I think, to thirty thousand dollars. Who, then, knowing these things, can doubt of his having been among the most prominent saviours of his country!"

Those were times, as Mr. Peters adds, "when *wants* were plenty, and *supplies* lamentably *scarce*." The fearless manner in which property and personal responsibility were risked, is worthy of all praise. It was the tone of the day; a spirit of disinterested love of country prevailed, and a vigilance that no exertions could tire!

In December, 1781, Mr. Peters resigned his post in the War Office, upon which occasion Congress—"*Resolved*, that Mr. Peters's letter of resignation be entered on the Journal, and that he be informed that Congress are sensible of his merit, and convinced of his attachment to the cause of his country, and return him their thanks for his long and faithful services in the War Department."

After Mr. Peters left the War Office, he was elected a member of Congress, and assisted in

closing much of the business of the war, and of the welcome peace.

Public services, even in our own day, when all is peace and plenty, are too often accompanied by pecuniary loss. What, then, must have been the sacrifice, in the turbulent times to which I have just alluded! It was, as Mr. Peters used emphatically to call it, "burning the candle at both ends." But the reward was independence:—exemption from the heretofore vexatious rule of a government a thousand leagues off; the liberty to steer the vessel of state by our own compass:—this was a prize worth every sacrifice. We know the value of it; and we know how to cherish reverentially and affectionately the memory of those excellent men, who so willingly offered the sacrifice, and so nobly achieved the prize! This cannot be too often repeated.

The war left us in an unsettled state, which the good sense of the people soon put in order, by the organization of a new government, under the present Constitution. The great Washington, our first President, in looking round him for suitable men to fill the posts in his gift, selected Mr. Peters for the judgeship of the District Court of Pennsylvania. This he accepted, although he was desirous to take up his profession, and enjoy some respite from public labor. Since the peace, his fellow-citizens had sent him to the State Assembly, of one branch of which he was Speaker, at the very period, I think, when he was removed to the District Court. It was a new sacrifice to the public good; for I have heard my venerable friend say, that it comported neither with his wish nor his interest to throw up his pursuits at the bar, for an office of such small emolument. He yielded, nevertheless, to the request of the President, and assumed the exercise of its duties, which he continued until his death; being a period of thirty-six years, during which time he was seldom detained from Court by sickness, and never from any other cause. The admiralty portion of his judicial functions has been greatly simplified and improved under his care; and as a jurist in other matters, his decisions have been applauded here, and confirmed at Washington.

The President who placed him on the bench, knew him well, and took great delight in his society. When a morning of leisure permitted that great man to drive to Belmont, the birthplace and country residence of Judge Peters, it was his constant habit so to do. There, sequestered from the world,—the torments and cares of business, Washington would enjoy a vivacious, recreative, and wholly unceremonious intercourse with the Judge; walking for hours, side by side, in the beautiful gardens of Belmont, beneath the dark shade of lofty hemlocks, placed there by his ancestors, nearly a century ago. In those romantic grounds, there stands a chestnut tree, reared from a Spanish nut, planted by the hand of Washington. Large, healthy, and fruitful, it is cherished at Belmont, as a precious evidence of the intimacy that subsisted between those distinguished men. The stranger who visits these umbrageous walks, trimmed and decorated in the style of the seventeenth century, pauses amid "clipped hedges of pyramids, obelisks, and balls," formed by the evergreen and compact spruce, to contemplate this thriving tree, and carry back his memory to the glorious and virtuous career of him who placed it there.

The duties of the District Judge, particularly when associated with the Judge of the Circuit Court, became sometimes extremely painful. Two insurrections—(the only ones that have taken place since the adoption of the present constitution) occurred in Mr. Peters's district. To aid in the suppression of the first, he followed the army as far as Pittsburgh,—the western limit of his jurisdiction; and there, with his usual promptitude and prudence, very satisfactorily discharged his official duties. In a few years after, he was called on again, to try for treason another set of rebels from the northern part of his district. His associate during part of the time, was the celebrated Samuel Chase, one of the Justices of the Supreme Court of the United States. The trial of these deluded insurgents, and the execution of the two acts of Congress so well known by the names of Alien and Sedition laws, gave great notoriety to the Circuit Court of this district. Its proceedings were narrowly watched by the political enemies of the Federal government, until at length, John Randolph, a member of the House of Representatives from Virginia, thought he saw cause of impeachment in the conduct of its Judges. Articles were agreed upon by the House of Representatives, and sent up to the Senate, against Samuel Chase; and great pains were taken to include Mr. Peters. Indeed the House inserted his name at one time; but on proper investigation, it was withdrawn, under a conviction that no cause of accusation existed: on the contrary, when the examination took place, it was found that his judicial course had uniformly been marked by prudence, decorum, and moderation.

The violence of the times, the irksomeness of the Court duties, the vituperative or thankless voice of the then governing party, might have discouraged an ordinary mind; or at least have limited its action strictly to the business of the bench. Not so with Judge Peters. Almost at the very moment, when political strife was at its hight, we find him promoting, and chiefly directing, one of the most beautiful and most useful improvements in the State. I allude to the permanent means of communication, created in the year 1803, between the city and the country, by the erection of the great bridge over the Schuylkill, at the end of High-street. It belongs especially to us who reside on the west side of that river, to assert the merit of the citizen who originated, superintended, and completed this noble work. Many of us recollect the interruption, the delay and the danger of the passage, twenty-five years ago, now so fully obviated by the splendid structure placed there at a cost of three hundred thousand dollars!

Judge Peters, the first President of the company at whose expense it was built, commenced his service in this work, with a zeal and courage which alone could conquer the natural difficulty of the water piers; and it is proper to notice here, as illustrative of that gentleman's sagacity and foresight, that to his perseverance (I had almost said *management*) do we owe the permanency of that bridge; for, the company, discouraged by the great expense, had resolved not to cover it; and governed by this determination, left it for two or three years wholly exposed to the weather; so that had not Mr. Peters, by constant solicitation, persuaded them to give it its present defence, its usefulness would have terminated in about twenty years; when, decayed and rotten, it would have fallen into the river. But with the cover which now protects and ornaments it, it will last a century or more.

Before Mr. Peters became a Judge—indeed, soon after the War closed in 1785—he visited England. His travels in that country and the adjoining kingdoms under British rule were extensive. He had in charge, on this occasion, a commission somewhat of a public nature, and which introduced him to the acquaintance of the Primate and principal Prelates of the English Church. Before the Revolution, the Protestant Episcopal Church in this country, of which Mr. Peters was a member, was governed by the Bishop of London; but when our political connection was dissolved, no Protestant Church here would consent to be regulated by a foreign diocesan. Mr. Peters, therefore, was commissioned to obtain the consent of the British prelates to ordain to the holy office of Bishop three priests of the American Episcopal Church, and thus give to it a canonical succession. An act of Parliament had already been obtained by the Bishop of London, to enable him to dispense with such of the usual requisitions as were inconsistent with the engagements of certain citizens of the United States who had applied to him for *holy orders*; and, about the time the higher question of succession was agitated, the same subject was brought before the Danish Government, in consequence of a conversation between Mr. Adams, our then Minister to Great Britain, and the Danish Minister to the same Court, to which a favorable answer was given; so that the Danish Church stood ready, in case of difficulty, to confer on our Church the necessary powers of Episcopal succession. But it is believed that this incident had no influence on the conduct of the British Government or Church, both of which are represented by Mr. Peters, in a letter from England, dated March 4th, 1786, as favorably disposed; and subsequently confirmed by the courteous and friendly reception of Right Rev. and venerable Bishop White, and his colleagues, who found the Archbishops and all the Bishops who were consulted on the business, acting with the utmost candor and liberality of sentiment; so that it is obvious that the English prelates were, from the first, ready and desirous to convey the succession to the American Church; and that the only condition they made was, that there should not be such a departure, either in discipline, worship, or doctrine, as would destroy the identity of the two Churches in their *spiritual* character.*

While we admire the Christian feeling which characterized the hierarchy of England at that period, it may not be thought inopportune to testify our regret at the prejudice which has grown up since, among clergymen and theological writers, when they have occasion to refer to the American Church. Catching the illiberal spirit of the lay-journalists, the conductors of some of the British periodicals, devoted to Church matters, speak of our country in language coarse and unbecoming; and one theological journal, of wide circulation, and published in London, reviews a sermon of the Bishop of New-York, by denying to him, throughout the review, the prelatic title of Bishop—as if too sacred or of too high a dignity for a people whom it purposely treats with disrespect. This critic sneeringly calls the widely-extended and flourishing Episcopal Church of the United States, governed as it is by ten Bishops, and more than four hundred ordained clergymen, planted over thousands of miles—sneeringly calls it, I say, "*an obscure Church, on the borders of a wilderness.*"

Mighty as has been the growth of this empire—prosperous as have been all its institutions—a wilful blindness and inveterate prejudice—I had almost said, a propensity to falsehood—seize on the minds of the writers of England, whenever they refer to our happy land. Why are these taunts so often the theme of their statesmen, as well as their critics? Can they be aware of the injustice they do us?—of the alienation of affection and kindred feeling which they work here? Or, do they grieve and scold because we get along too fast for them? If it be envy that produces this tone of sarcasm and contumely, I know not when it will cease; but if it arise from pride of wealth and numbers, it must soon stop; for the day is near at hand when an equality of power in population and riches will place us on a par, and then they may think us fit to be counted "*as* of the same father's house."*

We now approach, gentlemen, a period in the life of our departed President, which brought us into close intimacy with him. It was a long period of wide-spread usefulness, in which he moved almost without a rival. As a practical farmer, Mr. Peters had, from time to time, communicated the results of the experiments made at Belmont to such of his neighbors as chose to profit by them; but he had not written much, if

* This statement was furnished, in substance, by a most respectable Episcopal clergyman

* Let us hope that this disposition to disparage our country—and which, truth requires us to admit, is fully reciprocated—far from corresponding with, is contrary to the general public sentiment of the two countries. Demagogues there will ever be, in all countries, ready to excite and then pander to national antipathies. Let us hope that evil disposition does not prevail, on our side of the water, to a greater extent or in higher circles than in England. The well-informed, the loyal, the patriotic, and the virtuous, on both sides, sincerely wish for the maintenance of justice and of peace, and for the prosperity alike of both countries. That England looks to us, through a direct trade, for the material of her great branch of national industry, implies that she is our best customer; and, the more she prospers, the more she can buy—for the more she will consume. If, in some things, we are rivals in foreign markets, let it be the fair rivalry of industry and enterprise. There will yet remain points of reciprocal interests, enough to maintain the interchange of good offices, and to beget that desire, each for the other's growth and welfare, which is cherished—let us hope—even on nobler grounds than self-interest, by the wise and the good of both countries.

In some proof of the existence of that feeling in high quarters, we take leave to submit an extract from a letter, with which we have ourselves lately been favored, from a nobleman of the highest rank, and, at the same time, one of the plainest, most practical and actively useful *farmers* in all England:

[*Ed. Farm. Lib.*

WISETON, August 9th, 1845.

* * * "Anything which proves a kindly feeling toward me from the citizens of the United States, always gives me great satisfaction—it being impossible that any Englishman can desire more earnestly than I do that the friendly relations between our two countries shall be permanent."

anything, upon Agriculture, before the year 1797. His first publication was then made, and contained a statement of facts and opinions in relation to the use of gypsum. This pamphlet circulated widely, and produced such a change in husbandry, by introducing the culture of clover and other artificial grasses, as gave, we all know, a magical increase to the value of farms. Estates which, until then, were unable to maintain stock, for want of winter fodder and summer pasture, were suddenly brought into culture and made productive. Formerly, on a farm destitute of natural meadow, no stock could be supported; and even where natural meadow existed, the barn-yard was exhausted to keep up sufficient fertility (in the absence of irrigation) to feed a very few horses and black cattle.*

Such was the situation of our husbandry for some years after the Revolution. It is proper to advert to it, that we may understand the full extent of our obligation to the Judge. In the year 1770, he was shown the effects of gypsum on clover, in a city lot, occupied by Mr. Jacob Barge, on the commons of Philadelphia.

The secret of its powerful agency came from Germany, where it was accidentally discovered. Mr. Peters obtained a small quantity, which he used successfully, and gradually promoted its consumption, until, by his example and his publications, the importation from Nova-Scotia alone, into the single port of Philadelphia, increased to the enormous amount of fourteen thousand tons annually. This was before the discovery of that fossil in the United States.

Inquire in the counties of Chester, Lancaster, and others around us, where clover is so beneficially cultivated, how much is due to that excellent man for the great pains he took to extend the use of gypsum? On this subject, I very recently transmitted to the Judge a testimonial of gratitude from one of the most intelligent persons of Lancaster, who unhesitatingly ascribes to Mr. Peters's book on plaster, and his other agricultural essays, the merit of having produced a good part of the rich cultivation for which that country is so celebrated. But his rural labors were not confined to the tilth of the ground—to the mere variety of grasses, or alimental improvement of the soil which produced them—for we find him zealously employed in mending, by crosses, the breed of sheep and other animals. To him was confided the care of the broad-tail Barbary rams, procured at Tunis, by General Eaton. The Judge placed them advantageously, and pressed on the farmers, by repeated written exhortations, the propriety of using them.*

In order to appreciate properly the industry of this gentleman, in treating on husbandry and matters auxiliary to it, we must consult his voluminous communications, published in the Memoirs of the Philadelphia Agricultural Society. Take, for instance, the first volume. There we find him discussing, with his accustomed animation, and clear and elegant style, the following topics:

On Hoven Cattle.
On Peach Trees.
On Yellow Water in Horses.
On Gypsum.
On the thickness, cement, and materials of Walls.
On Orchards.
On Coarse Flour.
On Brown Bread.
On the Force of Habit, as it relates to Esculents.
On new Herbs and Shrubs appearing after firing Woods.
On Trench Plowing.
On Hemlock for Live Fences.
Remarks on, and Plan of, a Stercorary.
On Changes of Timber and Plants.
On Races of Animals Extinct.

These numerous articles, so various in their character, are, as I have said, contained in the first volume, and are all copiously and ably treated by him. The succeeding volumes are no less rich in original essays on the science and art of Agriculture, from the same prolific pen. Perhaps it is not estimating the *quantity* of his labor too high, if we place it at one-fourth of each volume; the *quality* of these productions must be valued according to their wide circulation and great popularity.

This distinguished citizen, always vigilant in promoting objects of public utility, founded our Society, and presided over it from the day of its creation until his death. You, gentlemen, will, one and all, I confidently assert, most readily and most gratefully bear witness to his constant solicitude for the advancement of the objects of

* Next after the invention of the cotton-gin, by Whitney, few things have done more to add to the value of agricultural productions than the *use of gypsum, or plaster of Paris*; and, above all other persons, Judge Peters contributed most to dissipate the hesitation and doubts that generally stand in the way of great innovations, such as that was. To believe that a bushel of sulphate of lime, spread on an acre of land, would have such effects as were described, seemed to promise nothing but ridicule for those who could entertain it; but its application, at that rate, on clover sowed on the poorest land, two successive seasons, enabled the farmer to raise from six to eight barrels of corn, and raised the price of his land accordingly.

What has most perplexed inquiring minds, even to this day, has been the fact that, while it acts with wonderful force on one farm, it is inert on another, perhaps adjoining. If it improves land by drawing nourishment for plants from the atmosphere, say they, why should that not be attracted by any other manure? and why should gypsum not exert that influence in one locality, or on one farm, as well as on another? The truth is that Agricultural Chemistry has not yet done its office on this point, though we doubt not it will; and our anticipation is that it will discover, in the land upon which it has no influence, the presence of some chemical agency in the soil, which neutralizes and destroys the virtue of the gypsum.

In the South, it is ascertained, by practice, that its action is equal on the various leguminous crops, and as powerful and as generally used on the pea as on the clover crop. [*Ed. Farm. Lib.*

* For a history of these sheep, see letter from Judge Peters to J. S. Skinner, then Editor of the American Farmer, Baltimore—dated August 14th, 1822—which letter will be found next after this memoir.

Beside the writings referred to by Judge Breck, the volumes of the American Farmer contain others of great interest. [*Ed. Farm. Lib.*

our association. How often has he pressed us to attend to them! His superior sagacity could discover a usefulness in labors which we had not before thought important. When, at length, we yielded to his wishes, and consented to register the occurrences on our farms, how much information was elicited! The improvement derived from this mutual examination was acknowledged by us all. It is much to be regretted that these business-like meetings have, of late, been few and far between. But such as they were, and transient as they now are, I dare refer to the records for proof of their solid worth. What though they have been followed by occasional listlessness, indifference, or non-attendance, that baffled the later efforts of our good President—may we not remember that our early zeal, though short-lived, was salutary!—Can we not revive it? Let us try, if it be only to show our love for the man who first inspired it. Our opinions on rural matters—our knowledge of agricultural facts, then so freely communicated, stand on record; we then possessed the attributes, as well as the name, of an Agricultural Society. Those communications evinced, by their variety, their practical meaning, their good sense, and, not unfrequently, their novelty, the rich fund of information among us in the concerns of husbandry, and show how profitably it may be again employed. We have but to will it, in order to restore it to its former usefulness.

Having endeavored to portray Mr. Peters as a patriot, a legislator, a jurist, and a farmer, it remains to speak of him as a man in social life.

Unceremonious, communicative, friendly—we who have so often shared in the delight of his unequaled companionship, under this roof, and at the festive board, when, at our annual dinners, he gradually rose, in hilarity and noisy mirth, with the wine-drinkers, by drinking himself, as he would playfully say, like a fish—accompanying our libations of Madeira with draughts of water—we can testify to his wonderful flow of wit, joviality, and laughter-inspiring spirit. It was on those occasions that, for a long evening, "he talked with fluency mere pun," mere joke and frolic. He needed no artificial aid, where Nature had been so liberal; and, with his *goblet of water* by his side, he kept pace in merriment with the company he was exhilarating; and this, too, when an octogenarian! Indeed, it was only with the lamp of life that this love of jest became extinct. Yet, so well-timed, in such good taste, was all this gayety, that no want of dignity or decorum was ever known. It was a spontaneous effusion, so natural and so pleasing that it made you love the man you already respected.

As a husband—a parent—a neighbor—a sincere Christian—there was, in reference to Judge Peters, but one voice. Every one united in praising his domestic and religious virtues.

Here I conclude, with many thanks for your indulgence, and the hope that a life so usefully spent will be contemplated by us, as eminently worthy of imitation—if not in all its varieties, at least in such portions as we may be able to copy.

TUNISIAN SHEEP.

We have great pleasure in recording the following authentic history of an importation of Tunisian Sheep, and we particularly desire that our correspondents would furnish us with accounts, as detailed, respecting every importation of Live Stock, which has come within their knowledge; and especially, when the facts so conclusively demonstrate the tendency of agricultural pursuits and subjects to inspire all who embark therein with a liberality of feeling and design, which, so far from admitting the idea of venal rivalry or sordid monopoly, bid every one generously welcome to the fair enjoyment of new sources of profit. [*Ed. Am. Far.*

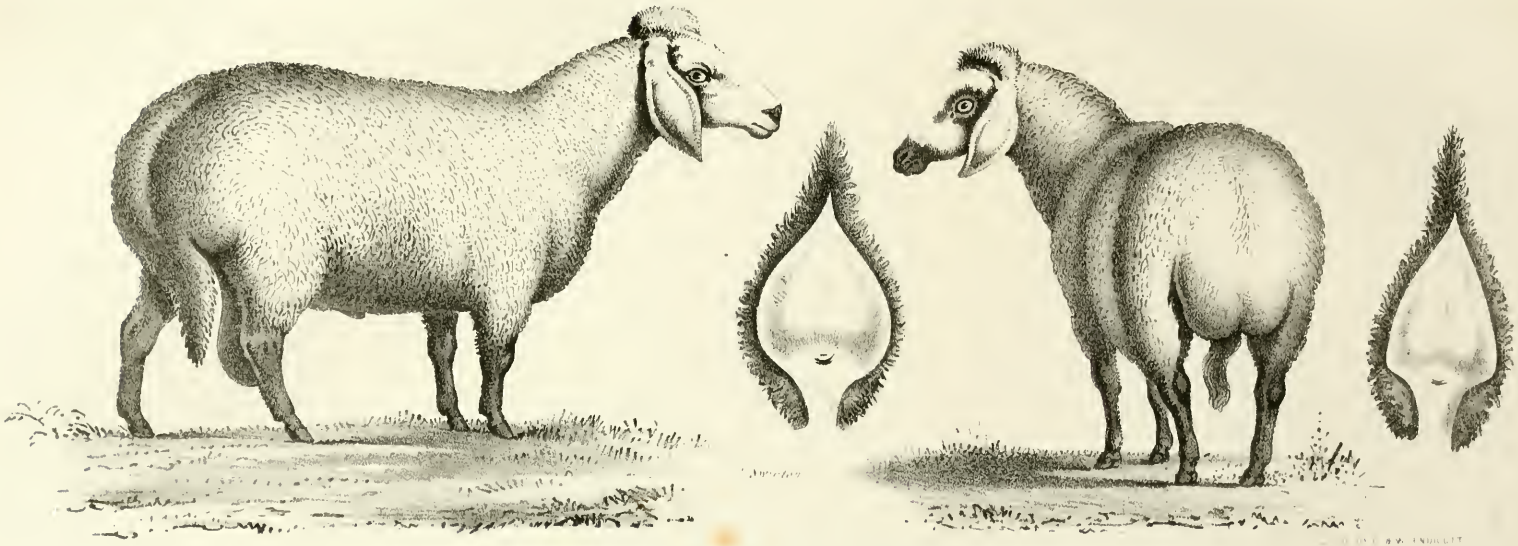
BELMONT, August 14, 1822.

Dear Sir: In your paper of the 2d instant, I see queries respecting the TUNIS BROAD-TAILED SHEEP. "*How many were received! and were any sent into other States!*"

I have given a full account of these sheep in the 2d volume of the *Philadelphia Agricultural Memoirs*. My opinions continue unaltered; and I had supposed the subject to have been exhausted. I have no desire to revive it, farther than to answer your queries as fully as historical facts require; and *that* with no personal objects. I do not relate the circumstances to blazon my own exertions; but, under a persuasion that a useful moral may be drawn from them, I am the only person acquainted with the whole subject, to which I do not mean to give more importance than your inquiries seem to elicit. Col. *Pickering*, with his accustomed candor, has published, in *Poulson's* paper of the 4th or 5th of July last, what he thought proper as to himself. The paragraph has not his signature; but he informed me of his having written it; and I mention it, for reasons operating with me.

I understood, *from Gen. Eaton*, and so did Col. *Pickering*, that eight or ten sheep were shipped; but only a pair arrived. Being far preferable to the coast sheep, they were procured by Gen. *Eaton*, (as he informed me) off the Dey's farm in the interior of the country, by the Dey's permission, as a compliment to the United States. It was therefore proper that they should pass under the direction of the Secretary of State. They arrived in the *Delaware*, in a public ship, and of course were placed by Col. *Pickering* in the neighborhood of the port of arrival. It would have been out of character with him, (only one pair having arrived) to have sent them into any other State; nor would he have so done, in whatever way he might have received them. I was informed that the rest of the shipment perished at sea. Capt. *Geddes*, to whose care they were committed, had a character too respectable to permit any supposition that he was either negligent or selfish; yet Gen. *Eaton* expressed much dissatisfaction and chagrin.

The burthensome, though not regretted, deposit was put into my hands by Col. *Pickering*. Considering myself as a kind of trustee, and always desirous of spreading through our country



TUNIS, BROAD-TAILED, MOUNTAIN, SHEEP.

New York Published by Greeley & McElrath at the Farmers Library J. S. SKINNER, Edt

the benefits of such acquisitions, I refused offers of emolument, though no terms forbidding personal profit, were made. I gratuitously dispersed the breed, not only in Pennsylvania, but into the neighboring States; at no small trouble and expense to myself. Several victualers, finding the superiority of the mutton over that of all other sheep, both in quality and price, made up a purse, and offered any sum I chose to fix for the Ram. I refused the proffer; and after his covering, during several seasons, great numbers of ewes sent to my farm, and there pastured and served without charge, he was conveyed to my late friend, Gen. *Hand's* farm, near Lancaster, where he was killed by dogs, after propagating the breed extensively. The ewe met the like fate on my farm; having yeaned a healthy lamb at sixteen years of age.

Chancellor *Livingston's* sale of two *Merino* sheep for $3000, gave impetus to the ardor which had begun to operate in favor of that breed. Had he *given* them away, the effect would have been far otherwise, on the minds of both farmers and speculators. *Voila les hommes!* Fancy paints profits in proportion to price paid. Small gains are counted on gifts, or cheap purchases.

Discovering the impolicy of continuing (however beneficial my distributions may, at first, have been,) gratuitously to bestow lambs, and of my other modes of dispersing the breed without charge; I encouraged my neighbor, *Thomas Bones*, in raising fine Broad-tailed Sheep from my stock, for sale on his own account. He did great justice to my confidence in him, and sold considerable numbers; many whereof, at their request, I selected for the purchasers.—Many were sent to *South Carolina*, as I mention in our volume. *The credit of, and demand for the sheep, were really enhanced by the prices paid for them;* though those prices were moderate indeed, compared with those of *Merinoes*, which overwhelmed the *Tunisians*, in public opinion, during the Merino-fever.

Country people do not value an article *given away*, presuming that it is held by the donor in small estimation; and in this they are not singular. The usual short-sighted practice among farmers, of selling to victuallers, or in the market, the best lambs and sheep, and keeping only those unsaleable, deteriorated the breed most lamentably. My tenants, who had the charge of my flock, had their share in this culpable propensity. Several butchers posted breeders from my stock in *Jersey* and *Delaware*. The progeny were slaughtered for the market. This also diminished the multiplication of the breed. Yet I was surprised by the information I frequently received, at the numbers produced from an original pair, even under circumstances not always encouraging.

I know of no other importation of Barbary sheep, contemporaneous with the subjects of this account. Long after the arrival of the pair mentioned, I was informed that Capt. *Baron* had brought some *broad-tailed coast sheep* into Virginia. But from the accounts of them I had heard, they were inferior to the Mountain sheep of *Tunis;* and so are all other African sheep which have fallen under my notice. The sheep of the Eastern countries, Asia and Africa, are generally, (with some exceptions) broadtailed.

Many years ago I saw in England, in the King's flock at Richmond, several of the *Laticandæ*. Some of them with cumbrous trailing tails, borne on little wheel carriages, dragged after them. None of them, in appearance, equal to the Tunis Mountain sheep. In my old, learned, and valuable work,—*Scheuchzer's Physica sacra*—there are plates, admirably executed, of victims for the Jewish altars. Among them, trailing breadtails similar to those I saw at Richmond. So that there are many varieties of the *Laticandæ:* and the success of breeders entirely depends on the selection of the valuable kinds.

The name, (as you seem to require it,) I gave to the Ram, was *Caramelli*, that of the ewe, *Selima*. They will, perhaps, become memorable as the first emigrants to our country, from this branch of the extensive family of the *Laticandæ*.

Not knowing exactly the object of your queries, I may have enlarged unnecessarily. But you may gather what you deem satisfactory for any purpose you contemplate. Yours truly,

RICHARD PETERS.

JOHN S. SKINNER, Esq.

THE COTTON PLANT....ITS HISTORY AND USES.

(*Continued from page* 181.)

ON its introduction into Georgia, the cultivation of long cotton was confined to the warm high lands of the Sea-Islands: these portions of the plantation are still everywhere preferred, and almost invariably return the largest yield, though their exhausted condition would seem to invite the more general tillage of the lower grounds. A few seed were either deposited in small hills,* about five feet apart, each way, or in holes made in the level land, separated at that distance. The spaces between the hills or holes were kept clean by the hand or hoe—the plow then, as now, was but little used. From the very limited number of plants that this plan insured, it is manifest that, in despite of the natural fertility of the soil, the harvest must have been meagre. Except in isolated instances, it rarely equaled 100 lbs. to the acre, which, at four acres per hand, gave but four hundred pounds to the hand. In 1794, a Bahama planter, who was traveling for his health, arrived in Georgia: he advised the growers to sow their cotton much thicker. This advice was unheeded by all, except Thomas Spalding of Sapelo Island, then a young man, and who has since largely contributed by precept and example to further the agricultural interests of his native State. He adopted in full the West India mode of drilling his seed along the ridge, and, by leaving the plants about six inches apart, he realized from a field of sixty acres, favored by a propitious season, the remarkable product of 340 lbs. of clean white

* The holes made in the ridges to receive the seed are still strangely called "hills" by almost every planter.

cotton to the acre. His success, with the previous adoption of the ridge-husbandry of Tull, introduced into Georgia, it is believed, by Hamilton Cowper and James Spalding, of St. Simon's Island, annulled the doubts of the wavering, and soon rapidly extended the culture of this valuable crop. In one year the revolution was accomplished, and from that time to the present, the distance of the plants asunder is regulated by the natural or artificial strength of the land—varying from eight to twenty-four inches, while the ridges, though separated in some of the Parishes four feet, and, in particular locations, six feet, are in general five feet apart. These, unlike the old usage, have for many years been made and preserved of an oval form, and large and high; first, the more effectually to subdue the grass, and to retard its early germination; secondly, to prevent the exposure of the lateral roots and fibres during the washing rains of summer; and thirdly, to keep the field as dry as possible; no plant probably requiring less moisture, particularly at the fruit-bearing season, than cotton. Although they increase the friability of the soil, which is a serious objection on very light lands, yet, the advantages just enumerated, the recent practice of leveling the ground, and the results of experiments, showing the decided superiority of large over small ridges, in very wet or dry weather, have constituted the former an almost universal expedient, at least in the lower Parishes. In relation to the early practice of depositing in the holes only three or four seeds, a practice common in Spain in the 12th century, experience has shown the wisdom of using a much larger quantity. Cotton is liable to so many casualties when young, particularly in the vicinity of the ocean, where the annual injury from winds is greater than is usually apprehended, that, except by the growers of the best descriptions of that article, from a half bushel to a bushel of seed to the acre is commonly sown. The excitement concerning superfine cottons, and the ambition of the planter to excel his neighbor in price, induce annual selections to be made; but as this task devolves on the proprietor, and can be done only in a limited way, a parsimonious use of the seed is the necessary result; hence, less than one quart to the acre is occasionally put into the ground.

The method of cultivation was very various, and without method, until about the year 1802 when it assumed a regular form in this State and Georgia. Then the crop was worked four times—the latest hoeing being from the middle to the last of July. The hoeings now are more frequent, from five to seven being usually given, and are begun earlier and finished sooner. The point appears to be conceded, that, when the plant puts out fruit freely, which may be expected early in July, out-door labor should cease, especially if the season be wet.

It has been already remarked, that the plow was practically unknown to the first growers of long-staple cotton. This is still true, although a half century has elapsed. The ridge-system; the levelness of the ground, requiring therefore numerous drains; the small quantity of land, from 3½ to 4 acres, cultivated to the hand,* which, from its lightness, is so easily and so much better attended with the hoe; and the impossibility of gathering the cotton as rapidly as the field may demand, if, with plows, the tillage embraced a larger number of acres—all seem to render the aid of this great agricultural implement utterly useless in the *culture* of the crop. In the breaking up of the soil, however, and, as an assistant, in forming the ridge, the plow is universally employed, except on the Sea-Islands, where only, by a few planters, is its value, in the latter operation, fully acknowledged.

The task in listing was formerly half an acre; in ridging, three-eighths of an acre; and in hoeing, half an acre. The present tasks are less, except in hoeing, which is the same. The beds are still changed as often as the same field is tilled. In Georgia, the attempt to make them so far permanent in low grounds as to continue for six or eight years, has in a few instances been successfully tried.* There is scarcely a doubt, from their depth of mould, and extreme richness in vegetable ingredients, that the experiment would succeed in the marsh-lands of South Carolina. The application of this plan to poor soils is forbidden by the necessity of furnishing them annually with fertilizing matter, which should be thoroughly incorporated with the earth.

Encouraged by the anticipated results of experience, if not in every instance by the actual product of their fields, our fathers continued to cultivate the grounds which their sagacity first selected for the new crop. After several years of exhausting tillage, a radical change in their plan of operations, it was apparent, must soon take place. Unaccustomed to imbibe information from books concerning their vocation, the plain alternative of resorting to virgin soils was adopted. This, with regret and mortification be it said, is still the popular expedient, except where necessity, that kind and blessed encourager of the arts, forces the reluctant to another, and, as experience testifies, far more profitable scheme. The land which could be the most readily prepared, was invariably chosen—the best, requiring a large expenditure of labor, neglected. Only recently have the swamps of some of the Parishes, and the immense tracts which lie along the line where the salt and fresh waters meet, arrested the notice of the cotton grower. These alone are capable of yielding an amount of cotton wool equal to the yearly exports of the State. Whether the enterprise of the agriculturists is adequate to the task of draining and embanking them, the future will develop. To those who have been engaged in this patriotic work, the encouragement for farther trials, on a more extended scale, is great, if not decisive.

Notwithstanding the woods every where, and the marshes, furnished an abundant store of suitable aliment, still, in his early efforts, the industry of the grower did not extend beyond the narrow limits of manuring his root potato field, comprehending the one-fourth of an acre to each laborer. There were no instruments to mow the salt grass, rakes for collecting leaves, nor carts especially designed to convey the vegetable offal to the cattle-pen. On Edisto Island, where the system of tillage is admitted to be good, and where probably as much enriching matter is dis-

* A larger quantity per hand could not perhaps be manured.

* "Twenty years ago," says Mr. Spalding, in a recent letter to the writer, "upon purchasing some river-land opposite to Savannah I adopted permanent ridges, planting a row of corn and a row of cotton, alternately: these ridges had stood nine years, when my son sold the plantation, giving, as I think, the best cotton and the best corn crops in Chatham county."

tributed over the land as in any other part of the United States, there was, in 1822, not one plow or scythe—the largest plantations had not more than two or three carts, and the utility of oxen, in practice, was absolutely unknown. Now, a cart and mule, or a yoke of oxen, to every six workers, is common; labor-saving machines abound; and every acre of cotton, and generally of provisions, is provided with, what at least is supposed to be, a proper quantity of appropriate pabulum. This salutary reformation in the husbandry of this small section of the State, was effected mainly by the establishment of an Agricultural Society in the year just alluded to. All that has been said in reference to Edisto, is applicable to most of the Sea-Islands, and, in a more limited sense, to a majority of the Parishes.

The first person in South Carolina who directed the planters' attention to the subject of manures, was Col. Thomas Shubrick. In a series of essays, published about the year 1800, he recommended the drifted wreck that is thrown up by the tides. From its use, perhaps improperly employed, no essential benefit was derived, but it accomplished the object of creating reflection and a free interchange of views among those who were most likely to lend their aid in furthering the design of this patriotic citizen. From that time, ephemeral communications on the proper food of plants, and its kindred questions, occasionally met the public eye. However liberal were the contributions of the Agricultural Society of South Carolina to this branch of agricultural improvement, it is certain that the almost simultaneous movement made by a large portion of our planting interest, concerning the renovation of land by animal and vegetable matter, is unquestionably to be ascribed to the writings of "Arator" by John Taylor of Virginia. The letters over that signature originally appeared in a newspaper. In pamphlet form they were circulated in this State in 1808. The number of subjects discussed; the important facts developed; the well-digested reasoning in support of the practices recommended for adoption; added to the high and intelligent source whence the essays originated—all concurred to render "Arator" an instructive and popular treatise. The advice of the writer on several points was not only promptly followed, but to this day many of his propositions are considered agricultural axioms. In relation to this State, it was not until about 1825 that manuring may be said to have been systematized. By the force of circumstances, the sea-board set the example,* which though strongly urged by the slender returns of their fields, is still apparently unheeded by many of the Parishes and districts.

Of all the fertilizing materials for the black seed cotton, marsh mud is held in the highest estimation; not for the reason of its abundance and contiguity to plantations, but because if the proper kinds† be judiciously used, it is the most profitable and certain in its results. It contains more nutritive and other valuable properties than any other natural compound,‡ and is specially adapted to light sandy soils.

Salt mud, as a garden manure, was employed in South Carolina in 1801. Judge William Johnson states, that in that year he commenced his experiments with it, and after repeated trials, arrived at the conclusion that it was a great meliorating agent.* It is said, that as far back as 1797, the late Gen. Vanderhorst was practically acquainted with its value.† The merit of its discovery, however, as a fertilizer for cotton lands, seems to be due to the late James King of St. Paul's Parish. By him it was freely used before the late war with Great Britain.‡

Until within a few months, the agriculturist of South Carolina was ignorant practically, and it might be added theoretically, of the efficacy of calcareous manures. It is true that lime as an improver of the soil has been long known to a few of our cotton planters. In 1800, and again in 1803, it was used by Kinsey Burden, then of St. Paul's Parish. Though his efforts with a new enriching ingredient were attended with the most signal success, it does not appear that the same gentleman ever afterwards resorted to it. A new era fortunately has commenced, and before another year has passed, lime and marl§ will be the most common, and the most extensively employed, of all the natural means for resuscitating exhausted lands. To Edmund Ruffin of Virginia, late editor of the Farmer's Register, and now by the authority of the Legislature Agricultural Surveyor of South Carolina,‖ all the benefit which shall accrue to individuals and the community by their application will have to be ascribed. His discoveries show, that marl exists in inexhaustible quantities throughout the lower country, and that calcareous matter in some form is widely distributed over the State.

Without an acquaintance with the component parts of soils, and our great staple crop, the appropriate pabulum to the one for the support of the other, it is manifest, cannot understandingly be applied. The first effort in this State, emanating from a public body, to obtain light on one of these interesting topics, was made by the Agricultural Society of St. John's Colleton.

☞ We had intended to conclude this article in this number, but owing to the length of other articles that demand immediate publication by us, we are compelled to postpone a portion of it until our next number. [*Ed. Farm. Lib.*

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* In 1805, nearly all the materials now used as manure, were then employed on the Sea-Islands, though in a very limited way.

† That on which the tall marsh grows is greatly to be preferred to all other kinds.

‡ See Note C. in the Appendix for the analysis of K.

*Southern Agriculturist, vol. ii. p. 483.

†Ibid, p. 547.

‡Ibid. p. 399.

§The antiquity and advantages of marling may be gathered from the following passage, which occurs in Fitzherbert's treatise entitled *Surveying*, first printed in 1539. Speaking of the improvement of bushy and mossy ground, he says: And if there be any marle pyttes that have been made of old time within the said close, than when the landes begyn to weare, if he have not sufficient of such bushy and mossy grounde to breake up and sowe, than there would be newe marle pyttes made, and the landes new marled, the which is moche better than outher donge, mock or lyme, for it will last twenty yeres together, if it be welie done, and shall be the better while it is land. And I marvayle greatly, that in the common felde, where of old tyme hath been made many great marle pyttes, the which hath done moche good to the landes, that nowe a dayes no man doth occupye them ne make none other, and they nede not to doute, but there is marle now as well as was then.

‖Mr. Ruffin was appointed Agricultural Surveyor with a salary of $2,000, at the December Session, 1842. To R. W. Roper, of Charleston, Chairman of the Committee to whom the question of an agricultural survey of the State was referred, the success of the measure is mainly to be ascribed.

[*To be continued in next number.*]

NATIONAL INSTITUTE.

LETTER FROM DR. JOSEPH JOHNSON, OF CHARLESTON, (S. C.) ON THE SILK PLANT, &c.

WASHINGTON, (D.C.) Oct. 4th, 1845.

FRANCIS MARKOE, Jr. Esq.

Cor. Sec'y of the National Institute, Washington:

Dear Sir—I read with much pleasure, in Mr. Skinner's July number of the Agricultural Journal, a Letter from D. Smith McCauley to you, from the Consulate at Tripoli, relative to the Vegetable Silk cultivated in that country; of which he also sent the seed and a drawing of the plant. I have now the pleasure of presenting a specimen of the plant, with its flowers and fruit, produced by cultivation on the Agricultural Farm near Charleston, S. C.

In March, 1844, I received a letter from Rev. J. B. Adger, Missionary in Smyrna, Asia Minor, from the Presbyterian Church in the U. States; and with it were various seeds, which I distributed among gentlemen most likely to take an interest in their propagation. Among them were the seeds of this plant, marked "Asclepias:" but, if I remember rightly, not designating the species. No mention was made of its uses or value. Some of the seeds I placed in the hands of Mr. Joseph O'Hear, Superintendent of the Agricultural Farm, and requested his care and attention to them. When your letter appeared in print, Mr. O'Hear not only had the plant itself in flower, but on it were some cocoons, or seed-pods, perfectly matured. He called on me with them, and said that the plant did not flower the year before, but that the stem and root had survived the winter, in an open exposure, and commenced bearing early in the summer; that he had lost the paper with its name, and could not have identified it but for the excellent drawing of the plant in Skinner's Journal. The paper with the name had been staked in the row, when he sowed the seed, to designate it, and was lost in the exposure to the weather. He told me, also, that eight or ten additional stems had sprung up from the roots, most of which had matured their fruit, or pods. When I saw the plants, the season was late and the flowering over; but I obtained a few flowers, with the other important parts of the plant, which I now enclose for the examination of yourself and friends.

When first matured and fresh, these follicles, or pods, resembled the cocoons of silk-worms as much as a vegetable substance may be expected to resemble an animal production. The plants being too much crowded, Mr. O'Hear intends transplanting the stems, and placing them about eight feet apart; the seeds he will distribute among the members of the Agricultural Society.

I have no doubt that the plant has been described and named by European botanists, but I have not met with any satisfactory description of it. It certainly is not among the numerous species found in the United States. As it may interest others, I give the best botanical description that I could obtain; which, conjoined with Mr. Skinner's plate, will give a pretty correct idea of the plant. It is a species of Swallow-wort, one of which is well known as the Trinket plant. In "Turton's Linnæus," it is classed *Pentandria Digynia;* and, we think, comes nearest to his *Asclepias Lunaria* of any other. The stem is simple, round, naked, and about 5 feet high. The leaves linear, channeled, in pairs, and crowded near the top. The flowers in small umbels, axillary, on long peduncles, yellow, nodding, petals very small, the horn not above the crown. The follicles ovate, a little pointed, ventose, thin, white, and spinous. The seeds numerous, black, oblong, and enveloped in a white silky wool, somewhat stronger in its fibre than the shining floss of other species.

Mr. Adger also sent us the seeds of a most delightful species of muskmelon, called the Cassaba melon, from a district in which it is chiefly cultivated and sent to the Smyrna market.—Cassaba is at the western extremity of Asia Minor, about midway between Constantinople and Smyrna, not far from the site of Ancient Troy. I have seen these melons highly commended by English tourists of taste, thereby confirming Mr. Adger's preference; in Charleston they were decidedly preferred in flavor to all others. The melons, from which the seeds were taken which I now send you, were the produce of Dr. Thomas Legare's plantation, on James's Island, near Charleston, and carefully cultivated by him. They succeed best on a good garden mould, damp but not wet, and containing a little lime. They should not be located near other melons, gourds, cucumbers, &c.—which may impair the flavor, and vitiate the seed for a future crop.

I remain, very respectfully,
Your obedient servant,
JOS. JOHNSON.

SOME THOUHTS ON TRANSPLANTING TREES.

THERE are few operations in American Husbandry, in which so much want of reflection, not to say gross and wilful neglect, is displayed, as in the *transplantation of trees*—whether for fruit or for ornament. It must, however, be admitted, that in this as in all other branches of rural industry, much improvement has taken place within a quarter of a century, since agriculturists commenced to *read* and to *reason* on the *prineiples* that are involved and brought into action in the practice of every branch of their business, as well as in the business of ship-building, or navigation, or of manufacturing iron or leather. The former practice was (to what a lamentable extent it still continues!) to dig a hole for a young and tender tree, as for a gate-post, just large enough to jam it down, often times doubling up the roots, throw back the dirt to fill up the hole, ramming it with a small rammer, or the handle of the spade, or the eye of a hoe, and there leave this tender creature, without more care or attention, to take care of itself. Let every reader ask himself whether there is much, if any, exaggeration in this statement of the general management of young orchards within his remembrance! Is it any wonder, therefore, that disappointment and mortification should ensue—any wonder that if the tree lives at all, its growth should be stunned, its existence sickly and unfruitful, and its death premature? Why, does any man believe that it ever was intended that such management, if it be not an abuse of terms to call it management, should be crowned with success? We might as well suppose that it was ordained that man should lie on his back and have nothing to do but to open his mouth, and the manna of Heaven which "suits every man's palate," would drop into his lazy throat! No, no! man was commanded, not only to replenish the earth, but to "subdue" it.—"In the sweat of thy face shalt thou eat bread," and for our part we have some difficulty in understanding in what sense the necessity for labor should be deemed a curse. "I have already enjoyed too much; give me something to desire," said the Prince of Abyssinia, on being asked if he wanted nothing, how he could be unhappy?

In transplanting a tree, instead of restricting our thoughts merely to its present existence and wants, it is proper that we should consider what is necessary to its *growth and prosperity*, and remember, that it will require nursing and care, such as we would bestow on a young colt—*food* to sustain life and promote growth, and scrubbing and vermifugent medicines to save it from the ravages of parasitic moss, and the internal and external attacks of worms and other insects; and he who is not prepared to provide the food, and to bestow the care here prescribed, to feed and defend it at the root, and to drive off its more open enemies, had better sit down in his sleepy arm-chair, hug indolence to his bosom, and be content to submit to the privations and disgrace that are the just portion of men too ignorant, or too lazy, to perform the duties that belong to their employment and condition in life.

Let him who transplants a tree (and the management of a single one will apply to a whole orchard) ask himself how and where it is to get the elements of its growth? Is it from the air? No! for in that case there would be some chance for its living, when planted in the way we have described; but the support is to come through the roots from the ground. Is it not, then, obvious that we should take care of two things?

1st. That the ground contains the suitable food, and

2d. That it be pulverized and made *easily* accessible to the roots, as far as they would be inclined to go, and that inclination bears a certain proportion to the greatest size that the tree would attain under the most favorable circumstances. Suppose the young tree to be planted, as used to happen, and still does in many cases, in a small hole, in hard, poor land, and then *reverse all these conditions*, as much as possible, and the work will be done in the way that common sense will teach every man it should be done; and that a regard for his own profit and reputation will lead him to do. In other words, let the whole orchard, if it be an orchard, be well manured, then let the *whole field*, not a particular round or square hole just sufficient to admit the roots, but the whole field, be deeply plowed, (if trench-plowed, so much the better.) and well pulverized, and so far, and not short of that, the Farmer will have, *up to that point*, done his duty. If the hole be made much smaller than the space which would be ultimately penetrated by the roots, provided they had their way, in well-manured ground, when the roots have extended to the circumferent limits of the hole dug for its reception, *then* will its growth receive a sudden check,

just as would the growth of a fat colt if suddenly put on short allowance, or a calf which had sucked from the whole udder, when restricted to one teat; and the farmer, good, easy man, wonders how his orchard should stop growing! Starvation generates disease, just as vermin are bred in the filth and rags of the lazar. So arborical poverty and sickness will contract moss which at once consumes the substance of the tree, and offers a ready shelter for the thousands of insects on the look-out for exactly such places to deposit their eggs, the young of which, when hatched, again find their natural food in the fruit. A tree, like everything else in nature, when it comes into existence, should be supplied with food and *kept growing*, if you wish it to attain its full natural growth and fruitfulness. The truth of this is illustrated in a thousand ways, for Nature is prodigal in her offers of instruction, if man, whose natural and sluggish tendency is to repose, would only keep his eyes open. What science does she not illustrate? For one instance, suppose a stalk of corn, under favorable circumstances, to reach great size, and to have ears that commence with a large number of rows, promising a prodigious yield; yet if there comes a severe drouth, the ground bakes, the roots are checked, and the air and the earth both become dry, and you will find that the ear of corn which had started with, we will say, 12 rows will contract to ten, and if these distressing circumstances of earth and atmosphere continue, finding that it cannot carry out its second undertaking, it will contract the number of rows again to eight; but, strange to say, it will always preserve an *even* number. All this we remember to have seen exemplified in corn exhibited at Wilmington, Delaware. Some have contended for proof of *intelligence* or volition in the roots of a plant from its selecting food adapted to its growth, and the rejection of that which would be deleterious. This alteration more than once of the design of the corn, to produce a certain number of rows, and its invariable adherence, under all circumstances, to an *even number*, looks yet more like volition or instinct. But let us admire the mysteries that we cannot penetrate and explain. Providence never designed that we should know everything at once, but wisely stimulates inquiry by the lively hope and ambition of new discoveries. In the midst of the deserts of Africa, when on the eve of perishing, the ill-fated MUNGO PARK shook off the despair under which he says he was fast sinking unto death, by seeing in the midst of that desert a delicate spear of moss, at which he said if even that was not beneath the care of Providence, why might he not yet hope to be saved? But to return to our subject. If plants of corn require a certain distance within which to grow, and to have the intervening space manured and pulverized, why should not *trees* require the same advantages in *proportion* to their size. True, the tree demands not, neither does it get the frequent stirring of the land which is indispensable to corn while growing, because its roots are stronger and its natural life is longer; but the tree does require the land to be well manured and well broken, at least when it is planted; and it is only when the planter is prepared to offer it that indispensable guarantee of life, growth, and fruitfulness, that he ought to take its life and managery into his keeping. If he cannot thus care for 100, let him plant 50, and if not 50, let him plant 10. Let him, in a word, in this case and all others, embark in nothing which he does not *mean to do well*, and, thank God and the progress of light and knowledge, the time is coming when the ignorant and slovenly farmer will lose caste and character as surely and as much as the pettifogger is contemned at the bar, among learned counselors, and the demagogue despised in executive offices and the halls of legislation, by true patriots and statesmen.

All this have we written without intending to do more than barely say a word in recommendation and support of the following essay, which we find in the September number of the English Farmers' Magazine. The reader will think that the comment has anticipated, without so well expressing the meaning of the text. Better than either, however, will he find the extract from Mr. DOWNING's valuable book on 'The Fruit and Fruit Trees of America,' to which it did not occur to us to revert, until we had written to the end of the preceding paragraph. We hope he will excuse us for offering to the reader a draft, which, large as it is, will only stimulate his thirst for more, and prompt him to take, at the original fountain, the book itself, from which we have drawn the chapters which follow the English Essay, for his instruction.

PREPARATIONS FOR PLANTING.

As the season approaches when trees of all kinds may be planted with every prospect of success, under circumstances most favorable to their success, it has been judged fitting to make some allusion to the preparation of land in general, referring to a future opportunity any notice of the soil peculiarly suitable to each.

Trees, agriculturally considered, are great enemies to the crops of the farm; and, as such, many writers of the day have successfully labored to show that, however ornamental they may be in themselves, and to the landscape of the country, their existence, in hedge-rows above all, is an evil, unless it be in exposed situations, where they may act as screens of defence against the violence of prevailing winds.

There are two or three writers of recent date whose works will be referred to, and recommended as guides to readers interested in the culture of ornamental and timber trees. These writers are Mr. Withers, of Holt, Norfolk, who

has written *con amore* upon this, his favorite topic; and Mr. Stephens, of Edinburgh, author of "*The Book of the Farm*," a work which ought to be in the hands of every agriculturist of the new school who is emulous to meet the emergency of the times by the relinquishment of ancient prejudices, and the adoption of new and improved modes of culture.

They who have candidly perused "*The Woodlands*" of the late William Cobbett, must acknowledge that his directions, whether in all cases correct or not, are precise, and intelligible to all. Its style is clear, its rules simple and perspicuous; and, as the author really begins at the beginning, any one who is desirous to do the work of planting effectually, may confide at least in the rules which are there laid down for the preparation of the land, because there is no mystification in them.

It is certain that the beauty of English scenery is mainly dependent upon the multitude of its hedges and hedge-row trees; but, as was proved by a late writer on the Agriculture of Devonshire, the country suffers severely by these ornaments; utility and productiveness are thus sacrificed; and, therefore, as we would have things put in their right places, we at once urge the abandonment of all those harborers of vermin, which cause the waste and deterioration of agricultural grain crops, in more ways than one, without any redeeming qualification, insomuch as the timber and underwood about a farm are, in themselves, of no remunerative value whatever.

But timber is a source of wealth; trees are glorious objects; and plantations adorn a country: therefore we would place them in appropriate situations, and grow them when there to perfection; but, to do so, the preparation of the land is a consideration of first-rate importance.

Trees ought, in fact, to be grown in woods; also, as screens or belts for protections; and in groups, or positions, where, placed singly, they may constitute a prominent and striking feature of park scenery. The late Rev. William Gilpin, in that interesting book, "*The Forest Scenery*," has afforded many striking examples of the effects of grouping, chiefly with a view to *picturesque beauty*: and we recommend the perusal of it to every one interested in the art of planting, for that express object.

But beauty cannot consist with stunted deformity; therefore we must, in the first place, study the soil and its effectual preparation; and upon these points our best writers are perfectly agreed.

Cobbett insists chiefly upon the thorough trenching of the land to the depth of at least two feet, reversing the surfaces if the soil be good to that extent; but he justly qualifies this position by observing that the soil may be such, in respect to its subsoil, "as to bring to the top something in which hardly anything will ever strike root—as, for instance, clear chalk, or pure sand, or gravel, or clay." When this is the case, the top mould must be kept at top; "but still *the trenching is always to be performed*, for the ground must be moved and turned to the depth of two feet." Mr. Withers is not content with trenching or deep plowing; he adds manure to the amount of twenty loads per acre, and says that, "when *you manure*, you never want to fill up, for all the trees are sure to take, and instead of filling up, you may, after the third year, take out and transplant at least a tenth part of them." (Memoirs, 1827.)

Mr. Withers's "Letter to Sir Henry Steuart, Bart., on the Improvement in the Quality of Timber"—1829—is a very valuable treatise, and worthy of being better known.

It is, perhaps, needless to revive the subject of a controversy which once was carried on most strenuously between the advocates of effectual preparation of land by deep trenching, and others who were content to open holes in the ground for each individual tree. "The cheap, hole-digging, short-sighted Scotch system," as it was called some twenty years ago, was "calculated to bring upon those who adopted it only loss and disappointment," that in this day of philosophical inquiry and chemical research, we have little cause to make farther allusion to that which experience must have disqualified. But it cannot be wrong or invidious to inquire into the causes by which deep comminution of soil will contribute to the permanent advantage of every species of vegetation.

Without farther entering into the mechanical processes of trenching, already described in the first part of the articles upon "*Orchards*," it will be relevant to insist upon the agency of those chemical constituents of soil—loams especially—which never entered into the calculation of the earlier writers. Our forefathers knew nothing of analysis; they had no idea of the existence of the phosphates, silicates, and alkalies, which modern Chemistry has brought to light. But now we know, and the knowledge is widely diffused—thanks to the enlightened German chemist, Liebig!—that, by the breaking up and the pulverization of earths, a volume of salts—usually termed the *inorganic* constituents of land—is distributed through the staple earth, and afford to timber those salts, the presence of which was deemed inexplicable.

Thus the thousands of tons of pearl and potashes, that have been articles of commerce to an extent almost unlimited, are now understood to be derived from the soil, and distributed only through (not formed or created *in*) appropriate vessels of the vegetable tissue. The laboration of the ground, therefore, is now proved, beyond question or doubt, to be indispensable, not only, as was supposed, to the first advances of young trees, but to their future progress towards perfection.

Trenching is, in no case, labor lost; and even where a single tree only is to be planted, to produce a particular effect, the hole to receive it ought to be prepared upon the principles of trenching—that is, by opening and comminuting the earth to a very considerable extent and depth, so as to insure good drainage, and the free tracings and extension of the roots, laterally, through a number of feet around the bole of the tree.

They who have traveled extensively, and witnessed the wretched progress of young trees that have been planted in holes so small as to require their roots to be, as it were, screwed into the ground, will want no other monitor to impress the great, undeniable truth, that early and effectual preparation is the only guarantee of success. Let any one try the experiment upon a couple of gooseberry bushes, by planting one in a narrow hole, and the other by expanding its roots in a soil worked and made permeable to the extent of a square yard, and the difference of the results will be sufficiently established before the lapse of two entire seasons. The soil shall be the same—a free unctuous *loam*—and the sites contiguous; yet one tree will be stunt-

ed, while the other shall produce luxuriant and healthful young wood; one will bear early a few starved berries—the other, though not so soon in maturity, will maintain a high state of fertility for, perhaps, fourteen years.

J. TOWERS.

TRANSPLANTING.

As nearly all fruit trees are raised first in nurseries, and then removed to their final position in the orchard or fruit garden; as upon the manner of this removal depends not only their slow or rapid growth, their feebleness or vigor afterwards, and in many cases even their life, it is evident that it is in the highest degree important to understand and practice well this *transplanting*.

The season best adapted for transplanting fruit trees is a matter open to much difference of opinion among horticulturists; a difference founded mainly on experience, but without taking into account variation of climate and soils, two very important circumstances in all operations of this kind.

All physiologists, however agree that the best season for transplanting deciduous trees is in autumn directly after the fall of the leaf. The tree is then in a completely dormant state. Transplanted at this early season, whatever wounds may have been made in the roots commence healing at once, as a deposit directly takes place of granulous matter from the wound, and when the spring arives the tree is already somewhat established, and ready to commence its growth. Autumn planting is for this reason greatly to be preferred in all mild climates, and dry soils; and even for very hardy trees, as the apple, in colder latitudes; as the fixed position in the ground, which trees planted then get by the autumnal and early spring rains, gives them an advantage, at the next season of growth, over newly moved trees.

On the other hand, in northern portions of the Union, where the winters commence early, and are severe, spring planting is greatly preferred. There, autumn and winter are not mild enough to allow this gradual process of healing and establishing the roots to go on; for when the ground is frozen to the depth of the roots of a tree, all that slow growth and collection of nutriment by the roots is necessarily at an end. And the more tender sorts of fruit trees, the Peach and Apricot, which are less hardy when newly planted than when their roots are entire, and well fixed in the soil, are liable to injury in their branches by the cold. The proper time, in such a climate, is as early as the ground is in a fit condition in the spring.

Early in autumn, and in spring before the buds expand, may as a general rule be considered the best seasons for transplanting. It is true that there are instances of excellent success in planting at all seasons, except midsummer; and there are many who, from having been once or twice successful in transplanting when trees were nearly in leaf, avow that to be the best season; not taking into account, that their success was probably entirely owing to a fortunately damp state of the atmosphere at the time, and abundant rains after the experiment was performed. In the middle States, we are frequently liable to a dry period in early summer, directly following the season of removal, and if transplanting is deferred to a late period in spring, many of the trees will perish from drouth, before their roots become established in the soil. Spring planting should, therefore, always be performed as soon as possible, that the roots may have the great benefit of the early and abundant rains of that season, and get well started before the heat of summer commences. For the neighborhood of New-York, therefore, the best periods are, from the fall of the leaf, to the middle of November, in autumn; and, from the close of winter, to the middle of April, in the spring; though commonly, the seasons of removal are frequently extended a month beyond these limits.

Taking up the Trees is an important part of the operation. A transplanter should never forget that it is by the delicate and tender points or extremities of the root that trees take up their food; and that the chance of complete success is lessened, by every one of these points that is bruised or destroyed. If we could remove trees with every fibre entire, as we do a plant in a pot, they would scarcely show any sign of their change of position. In most cases, especially in that of trees taken from nurseries, this is, by the operation of removal, nearly impossible. But although we may not hope to get every root entire, we may, with proper care, preserve by far the larger portion of them, and more particularly the small and delicate fibres. After being taken up, they should be planted directly; or, if this cannot be done, they should be kept from drying by a covering of mats, and when sent to a distance by being packed in damp moss.*

Preparing the places. Here is the fatal stumbling-block of all novices and ignorant persons in transplanting. An English gardener, when he is about to plant fruit trees, talks about *preparing his borders*; an American says he will *dig his holes*; and we cannot give a more forcible illustration of the ideas of two persons as the wants of a fruit tree, or a better notion of the comparative provision made to supply these wants, than by contrasting the two phrases themselves. The one looks upon a tree as a living being, whose life is to be rendered long, vigorous, and fruitful by a good supply of food, and a soil mellow and easily penetrated by the smallest fibre; the other considers it very much in the light of a truncheon or a post, which he thrusts into the smallest possible hole, and supplies with the least portion of manure, trusting to what he seems to believe the inextinguishable powers of Nature to make roots and branches under any circumstances. It is true that the terms differ somewhat from the nature of the culture and the greater preparation necessary in planting fruit trees in England, but this is not by any means sufficient to justify the different modes of performing the same operation there and here.

In truth, in this country, where the sun and climate are so favorable, where pruning and training are comparatively so little necessary, the great requisite to success in the ordinary culture of fruit trees is the *proper preparation of the soil* before a tree is planted. Whether a transplanted tree shall struggle several years to recover, or grow moderately after a short time, or at once start into a very luxuriant and vigor-

* We should notice an important exception to this in the case of trees packed for shipping across the Atlantic. In this case they should be packed only in *dry* moss; the moisture of the sea air being sufficient to keep the roots in good condition, while if packed in damp moss they will be injured by rotting or excessive growth.

ous growth, depends entirely upon the amount of care and labor the planter is willing to bestow on the soil for his trees. We have seen several instances where, side by side, one man planted his trees in large spaces of deeply moved and rich soil, and another in small holes in the common mode, which uniformly showed the trees of the first, larger after five years, than those of the last, after twelve.

No fruit tree should be planted in a hole of less size than three feet square, and eighteen inches to two feet deep. To this size and depth the soil should be removed and well pulverized, and it should if necessary be properly enriched by the application of manure, which must be thoroughly mixed with the whole mass of prepared soil by repeated turnings with the spade. This preparation will answer, but the most skillful cultivators among us make their spaces four or five feet in diameter, or three times the size of the roots, and it is incredible how much the luxuriance and vigor of growth, even in a poor soil, is promoted by this. No after mending of the soil, or top dressings applied to the surface, can, in a climate of dry summers like ours, equal the effects of this early and deep loosening and enriching the soil. Its effects on the growth and health of the tree are permanent, and the little expense and care necessary in this preparation is a source of early and constant pleasure to the planter. This preparation may be made just before the tree is planted, but, in heavy soils, it is much better to do it several months previously; and no shallow plowing of the soil can obviate the necessity and advantages of the practice, where healthy, vigorous orchards or fruit gardens are desired.

The whole art of transplanting, after this, consists in placing the roots as they were before, or in the most favorable position for growth. Begin by filling the hole with the prepared soil, within as many inches of the top as will allow the tree to stand exactly as deep as it previously stood. With the spade, shape this soil for the roots in the form of a little hillock on which to place the roots—and not, as is commonly done, in the form of a hollow; the roots will then extend in their natural position, not being forced to turn up at the ends. Next examine the roots, and cut off all wounded parts, paring the wound smooth. Hold the tree upright on its little mound in the hole of prepared soil; extend the roots and cover them carefully with the remaining pulverized soil. As much of the success of transplanting depends on bringing the soil in contact with every fibre, so as to leave no hollows to cause the decay of the roots, not only must this be secured by patiently filling-in all cavities among the roots, but when the trees are not quite small, it is customary to pour in a pail of water when the roots are nearly all covered with soil. This carries the liquid mould to every hidden part. After the water has settled away, fill up the hole, pressing the earth gently about the tree with the foot, but avoiding the common practice of shaking it up and down by the stem. In windy situations it will be necessary to place a stake by the side of each tree to hold it upright, until it shall have taken firm root in the soil, but it is not needful in ordinary cases.

Avoid deep planting. More than half the losses in orchard planting in America arises from this cause, and the equally common one of crowding the earth too tightly about the roots. No tree should be planted deeper than it formerly grew, as its roots are stifled from the want of air, or starved by the poverty of the soil at the depth where they are placed. It is much the better and more natural process in fact to plant the tree so that it shall, when the whole is complete, appear just as deep as before, but standing on a little mound two or three inches higher than the level of the ground about. This, when the mound settles, will leave it nearly on the level with the previous surface.

Mulching is an excellent practice with transplanted trees, and more especially for those which are removed late in the spring. Mulching is nothing more than covering the ground about the stems with coarse straw, or litter from the barn-yard, which by preventing the evaporation keeps the soil from becoming dry, and maintains it in that moist and equable condition of temperature most favorable to the growth of young roots. Very many trees, in a dry season, fail at midsummer, after having made a fine start, from a parched and variable condition of the earth about the roots. Watering, frequently fails to save such trees, but mulching when they are planted will entirely obviate the necessity of watering in dry seasons, and promote growth under any circumstances. Indeed, watering upon the surface, as commonly performed, is a most injurious practice, as the roots stimulated at one period of the day by water, are only rendered more susceptible to the action of the hot sun at another, and the surface of the ground becomes so hard, by repeated watering, that the beneficial access of the air is almost cut off. If trees are well watered in the holes, while transplanting is going on, they will rarely need it again, and we may say *never*, if they are well mulched directly after planting.

The best manure to be used in preparing the soil for transplanting trees is a compost formed of two-thirds muck or black peat earth, reduced by fermenting it several months in a heap with one third fresh barn-yard manure. Almost every farm will supply this, and it is more permanent in its effects, and less drying in its nature, than the common manure of the stable. An admirable manure, recently applied with great success, is charcoal—the small broken bits and refuse of the charcoal pits—mixed intimately with the soil. Air-slaked lime is an excellent manure for fruit trees in soils that are not naturally calcareous. Two or three handsful may be mixed with the soil when preparing each space for planting, and a top dressing may be applied with advantage occasionally afterwards, to increase their productiveness. But, wherever large orchards or fruit gardens are to be planted, the muck compost heap should be made ready beforehand, as it is the cheapest, most valuable, and durable of all manures for fruit trees.

Pruning the heads of transplanted trees, at the season of removal, we think generally an injurious practice. It is certainly needless and hurtful in the case of small trees, or those of such a size as will allow the roots to be taken up nearly entire; for, as the action of the branches and the roots is precisely reciprocal, and as new roots are rapidly formed just in proportion to the healthy action of the leaves, it follows that by needlessly cutting off branches we lessen the vital action of the whole tree. At the same time, where trees are transplanted of so large a size that some of the roots are lost in removing them, it is necessary to cut back or shorten a few of the branches—as many as will restore the balance of the system—otherwse the

perspiration of the leaves may be so great, as to exhaust the supply of sap faster than the roots can collect it. A little judgment only is necessary, to see at a glance, how much of the top must be pruned away before planting the tree, to equalize the loss between the branches and the roots.

When it is necessary to transplant fruit trees of large size, the best practice is to prepare them previously by digging a trench round the whole mass of roots, undermining them, and cutting off all roots projecting beyond this line. The trench should be dug at such a distance from the tree as will include all the large and sufficient ball of roots, and it should be done in the spring, or before midsummer, when it is desirable to remove the tree the next year. After all the roots that extend to this circular trench are cut off, the earth is replaced, and by the season following an abundance of small fibres is sent out by the amputated roots, which, when the whole is now removed, will insure the success and speedy growth of the tree. This is more completely the case when the tree is prepared two years before transplanting. A variation of this mode, which has been found quite as successful and less laborious, consists in leaving the trench open, and covering it with boards only, or boards with a top layer of turf. The tree then is somewhat checked in its growth, it throws out an abundance of small fibres into the ball of earth containing the roots, and is the next season transplanted with great ease and safety.

The proper size for transplanting varies somewhat with the sort of tree, and the kind of culture intended. It is, however, a maxim equally well settled, both among theorists and the best practical men, that health, immediate vigor, and duration, are all greatly promoted by transplanting fruit trees of small size—from three to six or seven feet. We are fully aware with what impatience the beginner, or a person who knows little of the culture of trees, looks upon trees of this size—one who is eager to plant an orchard, and stock a garden with large trees, thinking to *gather a crop next year*. The latter may indeed be done, but the transplanting so affects the tree, that its first scanty crop is followed by a long season of rest, and feeble growth, while the plantation of young trees is making wood rapidly, and soon comes into a healthy and long-continued state of productiveness—often long, indeed, before the large trees have fairly arrived at that condition. The small tree, transplanted with its system of roots and branches entire, suffers little or no check; the older and larger tree, losing part of its roots, requires several years to resume its former vigor. The constitution of the small tree is healthy and unimpaired; that of the large is frequently much enfeebled. A stout and vigorous habit—what the nurserymen call a *good stocky plant*—is the true criterion of merit in selecting fruit trees for transplanting.

Trees intended for orchards, being often more exposed than those in gardens, should be somewhat larger—not less than six, or more than eight feet is the best size. For gardens, all experienced cultivators agree that a smaller size is preferable; we prefer plants two years old from the graft. Most gardeners abroad, when they select trees with more than usual care, take what are called maiden plants—those one year old from the graft, and there can be no doubt that, taking into account health, duration, and the ease with which such a tree can be made to grow into any form, this is truly the preferable size for removal into a fruit garden. But we are an impatient people, and it is not till another after century of trial and experience in the culture of fruit trees, that cultivators generally in this country will become aware of the truth of this fact.

The facility with which the different fruit trees may be transplanted differs considerably. Plums are generally removed with most success and after them nearly in the order as follows:—Quinces, Apples, Pears, Peaches, Nectarines, Apricots, and Cherries; the latter succeeding with some difficulty when of large size.

Laying-in by the heels is a practice adopted as a temporary kind of planting, when a larger quantity of trees is at hand than can be set out immediately. A trench is opened, and the roots are laid in and covered with soil, the tops being previously placed in a sloping position, inclining to within a few feet of the surface. In this way they are kept fresh and in good order, until it is convenient to plant them finally. In northern districts, where the autumn is often too severe for planting, and the spring is frequently too late to receive trees in time from nureries farther south, it is a common and successful mode to procure trees in autumn and lay them in by the heels until spring, covering over the tops of the more tender sorts if necessary with coarse litter.

In planting an orchard, always avoid placing the trees in the same spot or near where an old tree stood before. Experience has taught us that the growth of a young tree, in such a position, is weak and feeble; the nourishment suitable to that kind of tree having already been exhausted by a previous growth, and the soil being half filled with old and decayed roots which are detrimental to the health of the young tree.

THE POSITION OF FRUIT TREES. SOIL AND ASPECT.

In our favorable climate many fruit trees will thrive and produce some fruit in almost any soil, except dry sand, or wet swamps. But there is much to be gained in all climates by a judicious selection of soil, when this is in our power, or by that improvement which may generally be effected in inferior soils where we are necessarily limited to such. As we shall, in treating the culture of each genus of fruit, state more in detail the soils especially adapted to its growth, our remarks here will be confined to the subject of soils generally, for the orchard and fruit garden. The soils usually selected for making plantations of fruit trees may be divided into light sandy loams, gravelly loams, strong loams, and clayey loams; the first having a large proportion of sand, and the last a large proportion of clay.

The soil most inviting to the eye is a *light sandy loam*, and, as it is also a very common soil, more than half the fruit gardens in the country are composed of this mould. The easy manner in which it is worked, owing to its loose and very friable nature, and the rapidity with which, from its warmth, crops of all kinds come into bearing, cause it to be looked upon with almost universal favor. Notwithstanding this, a pretty careful observation, for several years, has convinced us that a light sandy soil is, on the whole, the worst soil for fruit trees. Under the bright skies of July and August, a fruit tree requires a soil which will retain and afford a mod-

erate and continued supply of moisture, and here the sandy soil fails. In consequence of this the vigor of the tree is checked, and it becomes feeble in its growth, and is comparatively short-lived, or unproductive. As a tree in a feeble state is always most liable to the attacks of insects, those on a sandy soil are the first to fall a prey to numerous maladies.* The open loose texture of a sandy soil, joined to its warmth, affords an easy passage, and an excellent habitation for all insects that pass part of their lives in the ground, preparatory to rising out of it to attack the fruit, foliage, or branches of the tree.

Such are some of the disadvantages of a light sandy soil; and, in thoroughly examining many of the fruit gardens of the middle States the last few seasons, we could not fail to be struck with the fact that in nine cases out of ten, where a variety of fruit was unusually liable to disease, to blight, or to the attacks of certain fruit-destroying insects, as the curculio, the trees themselves were on sandy soils; while on the other hand, and frequently in the same neighborhood, the same sorts were growing luxuriantly and bearing abundant crops, where the soil was a rather strong loam.† For a few years, the growth and productiveness of the trees upon sandy soil, is all that can be desired; but the trees are shorter lived and sooner fall into decay than where the soil is stronger. If there is any exception to this rule, it is only in the case of the Peach, and judging from the superior flavor of this fruit on stronger soils, we are inclined to doubt the value of the exception even here.

Gravelly loams are frequently much better adapted for orchards than sandy, especially where the loam is of a strong quality, and the gravel is not in excess; and the hardier fruits usually do well on this kind of soil.

Strong loams, by which we mean a loam with only just a sufficient portion of sand to make it easily worked, are on the whole by far the best for fruit gardens in this country. A strong loam is usually a deep soil, and affords during the whole heat of summer, a proper supply of moisture and nourishment to the roots of trees. Fruit trees do not come into a bearing state so soon in a strong as in a sandy loam, because the growth of wood is more vigorous, and fruit buds are not so soon formed; but they bear larger crops, are much less liable to many diseases, and their longevity is much greater. The largest and most productive orchards of the Apple and Pear in this country are upon soils of this kind.

Clayey loams are, when well drained, and when the clay is not in excess, good fruit soils; they are usually strong and deep soils though rather heavy and difficult to work. Trees that will flourish on these soils, such as the Apple, Pear, Cherry, Plum, and Apricot, usually are very free from disease, or insects, and bear large crops. In a moist climate, like that of England, fruit trees on a clayey loam would die of canker, brought on by the excessive quantity of water contained in the soil, but such is not the case under the high and warm temperature of our summers. The finest, largest, and most productive Plums and Pears within our knowledge, grow in sites on the North river, when the soil is a stiff clayey loam, almost approaching a clay. Those fruits that on light sandy soils are almost worthless from their liability to disease, and the attacks of insects, are here surprisingly luxuriant and fruitful.

It is, however, well to remark, that some varieties of fruit, perhaps from the circumstances of their origin, succeed better on sandy soils than any other; thus the Newtown pippin will only arrive at perfection in a strong loam, while the yellow bell flower is finer when grown on a sandy soil. But these are exceptions to all rules, and what we have already stated, as to the relative quality of soils, will apply pretty generally to the whole of this country south of the Mohawk river; and it may be added that calcareous soils, of whatever texture, are better than soils of the same quality where no limestone is present.

Trenching is the most complete method of improving a soil too sandy, when the subsoil below is of a loamy or clayey nature. Deep subsoil plowing, by bringing up a sufficient quantity of the stratum below, will answer the same purpose. When the subsoil of a sandy soil is sand or gravel, the surface can only be improved by top-dressings, or the application of manures. Top-dressing with clay is the most simple means of changing the nature of such a soil, and it is surprising how moderate a quantity of clay will give a closer texture to light sandy soils. In manuring such soils, we may greatly improve their nature as well as condition, by using composts of peat or bog-earth, swamp muck, or river mud, instead of common barn-yard or stable manure. The former are not only more permanent and better as manures for fruit trees, but they gradually consolidate and improve the whole texture of the soil.

Indeed, no fruit garden, where the soil is not naturally deep and rich, is in *perfect* condition for planting trees, unless the soil has been well trenched two spades in depth. This creates a matrix for the roots, so deep and permanent that they retain their vigor and luxuriance through the drouths of summer and continue for a long time in a state of health and productiveness.

It is difficult to give any precise rules as to *aspect*. We have seen fine fruit gardens here in all aspects. Perhaps the very best aspect, on the whole is a gentle slope to the southwest, because in such positions the trees, when in blossom, are somewhat protected from the bad effects of a morning sun after spring frosts. But, to remedy that more perfectly, it is sometimes the practice to plant on the north sides of hills, and this is an effectual way where early frosts are fatal, and where the season is long and warm enough to ripen the fruit in any exposure. A due south slope is, south of New-York, frequently found too warm for many fruit trees, in soils that are light and dry.

Deep valleys, with small streams of water, are the worst situations for fruit trees, as the cold air settles down in these valleys in a calm frosty night, and buds and blossoms are very frequently destroyed. We know a rich and fertile valley

* This remark applies to the middle and southern portions of this country. North of the 43d degree, a light sandy soil is perhaps preferable as warmer and earlier.

† As an instance in point, the owner of one of the most highly cultivated gardens in the vicinity of Boston was showing us, in despair, some trees of the Seckel pear upon which he could no longer get good crops, or fair fruit, and lamenting the *degeneracy* of the sort. The next day we saw in a neighboring garden beautiful crops of this pear growing with the least possible care. The garden in the first case was a sandy loam; in the second, a strong loam.

of this kind in Connecticut where the Cherry will scarcely grow, and a crop of the Apple or the Pear is not obtained once in ten years; while the adjacent hill-tops and high country, a couple or three miles distant, yield abundant crops annually. On the other hand, the borders of large rivers, as the Hudson, or of some of our large inland lakes, are the most favorable situations for fruit trees, as the climate is rendered milder by large bodies of water. In the garden where we write, a fourth of a mile from the Hudson, we have frequently seen ice formed during the night, of the thickness of a dollar, when the blossoms of the Apricot were fully expanded, without doing the least harm to that tender fruit. This is owing to the slight fog rising from the river in the morning, which, softening the rays of the sun, and dissolving gradually the frost, prevents the injurious effects of sudden thawing. At the same time, a couple of miles from the shores, this fruit will often be quite destroyed. In short, the season on the lower half of the Hudson, may, from the ameliorating influence of the river, be said to be a month longer—a fortnight earlier in spring, and later in autumn, than in the same latitude a few miles distant; and crops of the more tender fruits are, therefore, much more certain on the banks of large rivers or lakes, than in inland districts of the same climate.

AGRICULTURAL DISCOURSE,

DELIVERED BEFORE THE QUEENS COUNTY AGRICULTURAL SOCIETY, AT HEMPSTEAD, L. I. OCTOBER 9th, 1845.

IN compliance with the following invitation, we delivered, on the 9th of October last, the succeeding Address:

JERICHO, Queens Co., Sept. 9, 1845.

Hon. J. S. SKINNER:

My Dear Sir—At a meeting of the Board of Managers of the Queens County Agricultural Society, held this day, a Committee was appointed to select a proper person to deliver the Address at their Fair and Cattle Show, to be held at Hempstead, on the 9th of October next.

The Committee have unanimously instructed me to invite you to be the Orator on that occasion; and, in discharging this agreeable duty, I can but express the hope that you may find it agreeable to gratify our desires.

With much respect,
I am, dear sir, your ob't serv't,
ALBERT G. CARLL,
Chairman, &c.

The following note and resolution explains its appearance in the pages of the "Farmers' Library:"

JERICHO, Oct. 9, 1845.

To the Hon. J. S. SKINNER:

My Dear Sir—Immediately after the delivery of your Address, this day, before the Queens County Agricultural Society, the following Resolution was adopted:

"*Resolved, unanimously.* That we tender to our most esteemed friend, Mr. SKINNER, our hearty and sincere thanks for the beautiful and interesting Address he has just delivered before us; and we beg he will furnish a copy for publication in the 'Farmers' Library,' and in pamphlet form."

Allow me to express the hope that you may find it agreeable to comply with this request of the yeomanry of our County, whose admiration for the Address is only equaled by their esteem and respect for its Author—in whom they recognize one of the earliest advocates for the improvement of American Husbandry.

I am, with great respect, my dear sir,
Very truly, your obedient servant,
ALBERT G. CARLL,
Corresponding Sec'y.

LADIES AND GENTLEMEN—MEMBERS OF THE QUEENS COUNTY AGRICULTURAL SOCIETY:

THE natural conjecture, how it is that, being almost a 'stranger within your gates,' I should have been thus complimented with an appointment to address you on an occasion of so much interest to you all, can only be solved by the supposition that some report of my humble labors, in other forms, may have led you to invite for your Advocate to-day one who, however otherwise inadequate, may yet venture to plead the merit of sincere devotion to your cause. Not that sudden and transient zeal, which ignites like powder, and explodes as soon—burning only at festivals and holidays—but that early-imbibed and enduring inspiration, which, falling from the lips of a parent, himself, by inheritance and by choice, a practical farmer, fell on the heart of the son—grew with his growth, and strengthened as maturing judgment qualified him to compare the various pursuits of life, and to note their bearing, respectively, on the welfare of society.

Going in early life to reside in a populous city, and casting about for occupation of those leisure hours which are always full of danger, it seemed to me, as does it not to you? to be passing strange that, with so many papers to enlighten and push forward all other pursuits, there should, until then, never have been one in

vindication of the rights and interests of American Agriculture!

While Law, Medicine, Mechanics, Commerce, and other trades and sciences, had their presses to proclaim their discoveries—to cultivate their peculiar literature—to assert their usefulness—to challenge the public confidence, and to exert their control over public opinion and the legislation of the country—not an organ was sounded to instigate improvements in American Husbandry, and assert the preponderating claims of the great producing class to public consideration, and to a proportionate share in all exercises of power calculated to affect the welfare of the Republic!—no! not a solitary press, that the American husbandman could call his own, until the humble individual who now addresses you, though occupied through the day in the discharge of an important public trust, determined, hit or miss, to make the experiment, and to see whether the agricultural community might not be brought to indicate a consciousness that they, too, had an interest to be exemplified, acknowledged and sustained; as the one in which reside, after all, and above all, the sinews of national power and the fountain of all national prosperity—an experiment to see whether they would be content to be for ever regarded as mere "hewers of wood and drawers of water" for subordinate and parasitical classes, or whether they would not rise in a spirit worthy of independent tillers of the soil, and let the country understand that they, too, had an occupation of surpassing usefulness; ay, and as susceptible as any other of taking the polish of Literature, of exemplifying the principles of Philosophy, of clothing the naked and of feeding the hungry, and, above all others, entitled to engage the care and to exercise its proportionate share of the power of Government!

Such, my friends, was the origin—such has been the constancy—of *my* zeal in the cause of the Plow; and thus it may have been that my humble name has reached you, and will account for what might otherwise appear as strange to you as it was altogether unexpected to me. But, if there be in this assembly any who have come in expectation of having their imaginations warmed, as by my learned predecessors, with glowing eulogies on Agriculture, and splendid narratives of how,

> "In ancient times the sacred plow employed
> The kings and awful fathers of mankind,"

all such will have too much reason to regret that your choice has fallen on one who, in all his efforts to promote our common object, has aimed no higher than to suggest what seemed useful in a plain, practical way. But though my hope has been to promote improvements in the practice, by an early and wide dissemination of all improvements in the art of Agriculture, that has not been my *only*—I had well-nigh said, my principal aim. No, my friends! it has been my ambition, vain though it may have proved, to assist in awakening American farmers to a sense of the obligation they are under to themselves and their children, to their calling and their country, to have the rising generation instructed in the different sciences and the various literature that belong to their own, as an intellectual and liberal pursuit, instead of being regarded as a mere mechanical, imitative drudgery, with which the mind had no concern.

Yes, gentlemen, measures should be taken to have taught in our schools, combined with some *practice* of Agriculture and Horticulture, the outlines at least, of Geology and Chemistry, that something may be known of the constituent parts and elements of soils and plants, and in the selection of manures with reference to both.

For the many years that I have written, *con amore*, on your pursuit, I have endeavored to spread my own persuasion, that every parent whose son is destined for the plow, should be careful to have him taught at school, and if possible, too, at his own fireside, the natural, botanical, commercial, and economical history and uses, and the medical and other properties of every tree, plant, fruit, grain, vegetable, insect, fowl or animal, that he raises or cultivates or catches or kills—from what country they came—what is their congenial climate, or to what one they may be transplanted and reconciled—how far they have been, or may be made subjects of commerce, or materials of manufactures—whether in the case of plants, they are valuable as food for or are designed only to clothe man or beast—whether though medicinal, they may not yet be poisonous, as most medicinal plants are; and, therefore, to be cautiously used, not extirpated. A slight knowledge of botany, for example, would instruct him that our invaluable potato, the boast of our continent, is a prominent representative of an order of vegetables, many of which are as deadly poisonous as the potato is, itself, eminently nutritive and wholesome. Among the members of this family, he would learn to recognize the deadly nightshade, and the bitter sweet, of which there are beautiful specimens covering summer arbors in the gardens of Saratoga.—So are of the same family, tobacco, and the dangerous *Stramonium* or Jamestown weed, which I have seen growing in such luxuriance near this town. A knowledge of its poisonous qualities would within my own observation have saved the bitter anguish of two parents whom I once met on the road in my native county, following two lovely boys, brothers, on their way to a common grave, there, as in life, to sleep in each other's arms, but now to sleep forever in their "narrow home." In their

ignorance and childish curiosity they had eaten of the berries of the Jamestown weed.

Entomology, too, or the study of insects, opens a wide field for amusing research, and is naturally allied to Agriculture, and inseparable from rural life and observation, as I have noted and argued in a chapter in the Farmers' Library, devoted to this subject. We are told that the skill of the great naturalist Linnæus, by the most simple observation, taught his countrymen how to destroy an insect—the *cantharis navalis*—which had cost the Swedish government many thousand pounds a year by its ravages in one ship-yard alone. After its metamorphoses, and the season when the fly laid its eggs were known, all its ravages were stopped by immersing the timber in water during that period. While the provident housewife industriously destroys the vermin that infest her closets and her dormitories, her less persevering spouse, in indolent despair, permits the residue of that immense family, undisturbed, to feed on his crops, and then patiently re-plants to supply them with a fresh banquet.

When I recommend elementary instruction in these subjects, so closely allied to practical Agriculture, and familiarity with which, it must be admitted, is so befitting every country gentleman, let it be borne in mind that nothing is more remarkable in this age of progress than the improvements which have been devised to facilitate the acquirement of knowledge in all the natural sciences. To that end illustrations are employed, and terms and language have been simplified and adapted to the comprehension of the most youthful and the plainest minds.

It was but a few days since that I received a journal from Ireland, under an address, in which I recognized the autograph of an accomplished lady and a faithful friend. Unfolding it to see what it contained, which it was supposed possessed interest for me, my eye fell upon an account of a public examination at the already celebrated (Temple Moyle) *Agricultural Institute* in Ireland; and truly was I gratified to see there, so fully carried out, all that the friends of enlightened Agriculture have hoped for or fancied in the way of agricultural education. I regret that I can only take room to transcribe a single passage. A fuller account, with the address of Professor JOHNSON, will be recorded in the "Farmers' Library." Of the examination, it states that—"It embraced every topic of interest to the enlightened agriculturist. Among other subjects treated of, were these:—The Nature and Composition of Soil—Draining—Subsoil Plowing—Rotation of Crops—Manures—The Composition of Vegetable Substances—Gases—Minerals—Fermentation—the different kinds of Wheat—Varieties of Rye and Barley—the best Soils for these Grains—Potato Culture, &c. The result was most satisfactory. Of the twenty-five lads examined, almost all showed that they possessed an intimate acquaintance with practical Agriculture, and that they were perfectly conversant with the scientific principles necessary, in order to become intelligent and judicious farmers.

I must repeat one remark of Professor JOHNSON, to the honor of the Scotch people. It should be printed and hung up in letters of gold, and read by every Chaplain of every Legislative Hall, and by every Minister of the Gospel in every State of this Union, where education is neglected. He says "that the poorest Scotchman, on the smallest lot of ground, will deny himself the necessaries—even of provision and clothing—for the sake of educating his children."

Substituting such a course of instruction as is here indicated, for our antiquated systems, it would surely come to pass in process of time and, at no additional expense, that our tillers of the soil would get to be a race of *real* GENTLEMEN farmers—in the true sense of the word—men whose hands, hardened by wholesome and honest toil, would yet have their minds imbued and conversations ornamented with all the various learning and literature associated with, and necessary to a gentlemanly, ay, and let me add, the most successful prosecution of the business of Agriculture. Such, my friends, is the character which we should all aspire to see, and which the *laws of every State* should be framed to secure for the free tillers of the soil of Republican America. Such men, so used to labor, and so blessed with intelligence, I know you have among you. Such a man, was the venerable patriot, TIMOTHY PICKERING, of whom I have heard it related that he was once, when Secretary of State, at a diplomatic dinner at the President's, when the fact of his being practically a working man, on his little farm, was brought into question; whereupon a disbelieving courtier asking him to let him examine his *hand*, received a grip like that of a blacksmith's vice, and was quick to cry *peccavi*. May the time come when every farm, in our land shall be cultivated by such cultivated men! —then and not till then shall we have realized the glorious promises of national independence, and all the blessings of free government—for after all—

What constitutes a State?
Not high-rais'd battlement or labor'd mound,
Thick wall or moated gate;
Not cities proud, with spires and turrets crown'd—
Not bays and broad armed ports,
Where, laughing at the storm, rich navies ride;
Not starr'd and spangled courts,
Where low brow'd baseness wafts perfumes to pride;
No! MEN, high-minded MEN;

Being called on so unexpectedly to pronounce

a discourse on your principal, and I hope favorite pursuit, I must confess that I came some days since to enjoy the hospitality of an estimable citizen, and to look around, not exactly to spy out the nakedness of the land, but to get some idea of your locality, your soil, your staples, and your Agricultural habits. A view of Long Island, such as is afforded by a ride along the Railroad to Boston, gives an unfavorable impression to the traveler who comes and goes, and carries away an idea of barrenness beyond all power of redemption. For myself, not altogether unacquainted with other and better portions of the Island, and with your wise and free use of ashes, fish, and other purchaseable manures, I was prepared to find a different and a better state of things.—I had heard of your nice salt marsh and clean artificial hay, and had seen some of the fine horses that live on it. The fame of your Newtown pippins had reached me in Maryland, where the soil and climate are said to improve them—your fine, fresh, and delightful game, of land and water, had, for some months that I have resided in your great Emporium, made part of my daily "bill of fare;" but I confess to you that I was not altogether prepared for so many evidences of skillful and economical culture—culture, as far as I dare venture to judge or pronunce an opinion, of the mind as well of the soil. As the Queen of Sheba said unto Solomon at the sight of all his magnificence—"the half had not been told me." You would have no reason to blush, if you could realize the prayer of Burns,

"Oh, wad some power the giftie gie us,
To see ourscls as ithers see us."

Above any Agricultural community with which I am acquainted, except, perhaps, game little Delaware, you carry into practice the truth which every one knows, but which too many disregard—That *unless you feed your land, your land will not feed you;* and hence I am persuaded money is more freely expended for manure on Long Island, than in almost any other district of the country. First, your soil is of a light hungry nature, permeable and open to the roots, of the plants, and readily yielding, in a single season, all that it has for their nourishment, and therefore demanding the restoratives, without which it would as certainly cease to produce, as the cow without feed would get poor and go dry. Another reason which makes it obligatory on you to buy and spread freely is, that from your proximity to market and the excellence of what you have to sell, you are naturally tempted to turn that into cash, which many other farmers by means of their domestic animals, or in the shape of litter, turn into manure. Hence it would be as unjust towards your land, as it would be impolitic in yourselves, not to give back in the shape of manure, a portion of the elements for the succeeding crop, which you have carried off and pocketed from the last one. To this day how many are there who act upon the system of wasting or selling off all the materials of which manure can be made, and neither making or buying any in return; forgetting the homely adage, which every good housewife understands, that, "Always taking out of the meal tub, and never putting in, will soon come to the bottom!"

I presume not to say, on observation, but let me put the question to your own candor, for it is a practical one of vital importance; do you who buy none—or in addition to what you buy, do you economise and turn to account every particle of everything which can be converted into sustenance for plants—as everything may that is susceptible of putrefaction or decomposition. Do you send to the byways and highways for the means of making, if it be but a shovel-full of manure, for even that much would give you a good hill of corn? Do you reflect how much and how directly every load of manure helps virtually to cheapen the price, by giving more fruitfulness to the labour, of the men you hire? Particularly I would ask, do you take measures to save every drop of that which is regarded in the best cultivated districts of Europe as the richest treasure of every farm—I mean the liquid manure. By well-constructed tanks all is collected and saved. Among other contrivances, a simple one is used to which every one might have recourse, to save all the offal of the dwelling and kitchen. They have a tight box, fixed on the frame of a common wheelbarrow, in which all is collected and removed for the time to an ash pit, the common stercorary of the homestead. Gentlemen, a word to the wise is enough. I merely ask the question, and as Paul Pry says in the play, "Hope I don't intrude!"

I have recently heard it said, by an old, observant and most respectable member and officer of this society, as worthy of note, and I mention it more for the general benefit than for yours, that those had been generally the most prosperous in this township who had been known *to expend most money for manure!* I may mention as a fact which has come to my own knowledge, that the hay of your artificial meadows is esteemed to be far superior to that of low land or natural meadows, and doubtless the fine quality and exceedingly cleanly character of your grains as well as grasses, proceeds from the use of ashes and well-rotted manure, and that which is the seedless product of your invaluable salt marshes.

But, gentlemen, after all, to talk about my giving you advice, why, I would as soon have undertaken to instruct Napoleon in the art of war, as to teach a Long Island farmer, after what I have seen, how to make wheat or corn.

or oats, or grass. Have not your annals recorded the fact that Farmer John A. King, in reaching to take off the first premium, has got up to 98 bushels to the acre, and yet was not the victor—and have I not sent to my native old wheat-growing State, Maryland, a specimen of white-bearded wheat grown by Mr. Harold, weighing 65 pounds, and utterly exempt from every species of extrinsic matter?

If, gentlemen, I might name one thing to which, from my limited views, your attention might be turned to advantage, it would be that you should begin to look for profit to the higher cultivation of a *greater variety of fruits* than I have seen growing on the waysides—you should remember, I respectfully suggest, that you have yet to meet a still more formidable competition than you have yet encountered, in the sale of all the great staples of Agriculture, which will bear transportation from the borders of the great lakes in the far west—a sort of transportation which will become yet cheaper in proportion to the quantity offered, and which injures nothing on the way by jolting or violence. True, by the instrumentality of your great public works (honored in passing be the memory of Clinton!) the proceeds of many industrious millions, must in time be brought into competition with yours; and at this you might repine, were it possible, without the vast trade which these works insure, to sustain the millions on your borders who will in the same time, be consumers of your produce. But cut off these public works, exclude that far distant competition, and what then? Your great and growing cities would dwindle into insignificance—rank and loathsome weeds would overgrow the paths of industry, and a second Volney would come along to meditate in view of their ruins, and say, as of Balbec and Palmyra—

"And now a mournful skeleton is all that subsists of this powerful City! Naught remains of its vast domination, but a doubtful and empty remembrance! to the tumultuous throng which crowded under these porticoes has succeeded the solitude of death. The silence of the tomb is substituted for the bustle of public places. The opulence of a commercial City is changed into hideous poverty. The palaces of the rich have become a den of wild beasts; flocks fold on the area of the temple and unclean reptiles inhabit the sanctuary of the gods! Ah! how has so much glory been eclipsed? How have so many laborers been annihilated? Thus perish the works of men, and thus do empires and nations disappear!"

Where then would be your market, and what the value of your lands? But as circumstances deny the monopoly that short-sighted selfishness might like to enjoy, prudence suggests that you should with circumspection prepare for the changes that imperious circumstances will force upon you. Do not these considerations invite you to a more extensive and more careful cultivation of the various fruits and culinary vegetables—beyond what may conduce to the health and comfort of your own family—in order to supply the necessary and the luxurious demands of an immensely populous and opulent City?

I confess to a decided partiality for these smaller branches of industry, because they are in their nature more domestic. Excellence in the management of gardens, orchards, and flowers, while it demands a certain degree of polite knowledge, at once indicates and cherishes the better feelings of the heart. Justly, then, may we extol the liberality and good taste of some of our opulent merchants, who, in the midst of their multifarious engagements, lend some of their time and the well-earned fruits of their enterprise to the embellishment of neighborhoods with villas and grounds, such as many around Boston, and, no less beautiful than those, Mr. Man ices's, in your own vicinity—such villas as may be supposed to have displayed the munificence of illustrious sages of antiquity, whose virtues were as eminent as their fortunes; and who, in the midst of luxurious splendor, continued to steal occasions to withdraw, and in every way to evince their partiality for the country. Trees have always seemed to me to have a sort of living or social quality—a power of engaging our affections by adventitious circumstances or associations, which few if any other inanimate objects possess in like degree. There is an old *Poplar*, on the college green at old Annapolis, which has tried the wings of many an unfledged poet—and been borne in affectionate remembrance by every succession of graduates to all parts of the world, for the last sixty years. What money would purchase the Spanish chesnut in the classical ground at Belmont, seat of the late Judge Peters, near Philadelphia, from a nut planted by the *hand of Washington!* or the ivy that, planted by the great English orator, Fox, still clings to the sacred walls of Lagrange, the hallowed residence of Washington's friend, the great and good Lafayette. He who introduces a new vegetable from foreign parts, or a tree fit for ornament or timber, better deserves to be rewarded with the honor and respect of his country, than many military heroes to whom monuments have been decreed by people and senates infatuated and servile.

Why not let us chronicle, for a Long-Island Captain ROCHESTER, the credit which I am told is his due, for having brought to this country the Ailanthus, or the tree of Heaven, in the ship Lion, from the East-Indies. A tree which has few equals in the ease with which it may be propagated, or in the rapidity of its growth; and, moreover, it is now said to rival, after a certain age, the weight and solidity of box-wood; and, if so, might it not be profitably cultivated in plantations, for practical uses.

If there be any radical mistake in your agricultural economy, a transient observer like myself, not fully initiated in all the reasons that con-

trol your practice, might be led to inquire how it is that you seem to give almost exclusive preference to *horse*, over *ox* or *mule* power, for the plow, for heavy work on the farm, and for transportation on your excellent roads?—exactly reversing, in this respect, the habits of the sagacious farmers of the old Bay State, whose circumstances so nearly resemble your own to all appearance, and to which State New-York seems accustomed to go annually for apostles, if not for examples, to enlighten us in the agricultural art. There, Agricultural Societies, after full deliberation, and with the express sanction of such wise counselors as the late John Lowell —*clarum venerabile nomen*—have expressly refused to offer premiums for horses of any kind—esteeming them the most expensive of all machines, animate or inanimate, employed in the business of the farmer.

As to the *ox*—they contend that he costs less to raise—is easier to break—lives on coarser food—consumes less—for gearing, shoeing, and grooming, costing almost nothing—and is ever ready for his work. That, while the horse is every day lessening, the ox is every day improving, in value—is exempt from diseases—and is even more valuable dead than alive, being in every part and parcel of him available, even in his hoofs and his horns.

And, then, as to the *mule*—in strength fully equal to your light lands—the planter of the South and the farmer of the South-West will tell you that his life, on the average, is more than double that of the horse; and, therefore, the capital in that heavy item is only to be half as often renewed. I think it 's in the "Pickwick Papers" that Sammy Veller asks the coachman, "Did you ever see a dead donkey?" "No."—"Did you ever see a man that had seen a dead donkey?" "No!"—"Did you ever see a man that had seen any other man that ever saw a dead donkey?" "No!"—And yet, gentlemen, I do not maintain that the life of this hybrid is everlasting; but I do know that the late General Ridgely, of Hampton, Maryland, who owned large iron-works, and employed between fifty and a hundred, once told me that if any man would make him a gracious gift of a full set of horses, on setting out in life as a young farmer, and require him to keep up the stock, he would reject the offer. Mr. Jo. Patterson, of Baltimore, conducting the same business on a large scale, with uncommon sagacity and circumspection, lately told me the same thing; and I have understood that when Mr. John Ridgely, of Hampton, succeeded to that magnificent estate, there was in one of his father's wagons an entire team that had worked together for 24 years!

I am not unaware that your reasoning is, and presume not to dispute its force, that you have to keep a span of horses any how, for your family to go to town occasionally, and to church on Sunday; and you tell me that the Ladies could not be reconciled to the use of these long-eared, hard-headed beasts! Well, this may be so; and far be it from *me* to refuse you credit for thus consulting their taste and their wishes.—Doubtless it is but one example of universal submission on Long-Island to the same resistless influence. But you must allow me to add that I hardly ever met with a housewiife who, if her 'lord and master' would only condescend to enter into a minute and frank explanation of his views and situation, would not cheerfully make any reasonable sacrifice of pride, or fashion, or personal indulgence, to promote their common good How often does the wife lend her husband her house-servant, and her dairy-maid, and even her cook, to go out to help him on the farm!—Ay, I have seen her pull off her very apron to be used by the seedsman in sowing his grain! And besides, after all, this antipathy to driving mules is but a national prejudice—an opinion; but opinion, it is said, is the queen of the world. For an illustration, look at Spain—the very home of the superb Andalusian horse. There the royal family and the grandees monopolize the *privilege* of driving mules—a privilege almost prohibited to the plebeians. There are now several teams on the mail line along the rich limestone valley of the Shenandoah! But, to come nearer home—in sight of this town, my friend Mr. Milhaud does, with a pair of mules, all the labor and hauling for his farm, on the margin of your extraordinary prairie, which stretches around for so many miles, and which, I learned with surprise, is abandoned to pasturage—its bosom never having been marked with the traces of a plow.

Nevertheless, gentlemen, I presume not to say that you have not good and sufficient reason for deciding in favor of the more active, sightly, short-lived, voracious, expensive and inedible horse. If the ladies insist, why, there 's an end of the matter; for we all admit that

> "Where a lady 's in the case,
> All other things give place."

And there 's no use in looking for other reasons, when one is all-sufficient—else I might attribute your predilection to something of that spirit of chivalry which at once produces and is produced by a passion for such unrivaled *goers* as you have on Long-Island—like the horse of Adonis, described by Shakspeare, in the universality of his knowledge—

> "So does *your* horse excel a common one,
> In shape, in courage, color, pace, and bone."

One thing more I will venture to suggest.—Small as are your farms, generally, compared with such as I have been accustomed to see in

the South, they must yet be tilled, in a great measure, by hired force, such as your neighborhood affords. Is it not, then, a matter appealing as well to your interest as to your benevolence, that measures be taken to confer some honorary distinction in the way of encouragement on laboring men, who habitually hire out, to establish for themselves a character for *sober and moral habits?* And that married men, in like circumstances, be induced to improve the appearance and comfort of their humble residences, by planting vines and shrubbery, and otherwise causing them to present that aspect of neatness, which every passer-by would regard with admiration, as signs that rarely deceive, of more than ordinary merit and rectitude on the part of the inmates?

More than mistaken—even wicked—is the suggestion that such simple adornments of his cabin are unsuited to the condition of the laboring man! Rather let the poorest be encouraged to construct, of unhewed posts, the rudest sort of bower about his door. Nature will kindly assist him to cover it with the honey-suckle and the jessamine, that ask but little care: and, then, what so sweet as his own *sweet briar*, which, the poet says,

"Grows along
The poor girl's pathway and the poor man's door?"

Kindly lend your countenance, even at some expense, if need be, to effect this reform: and the wayfaring traveler, as he passes, shall remark to himself that, within the sphere of this Society's influence, even the poorest show signs of melioration, and partake of the common refinement. Were it not that I dislike to appeal to all sinister motives, in a case which so forcibly addresses itself to the better feelings of our nature, I might add that your kindness would be remunerated in the improved value of your district, for it would then possess superior attractions for the very sort of people whom all would be most ready to welcome. In this work of charity, I undertake to answer for the hearty coöperation of every good housewife and every fair daughter on Long Island. Nature formed them for such offices: and he that invokes not their smiles on every good undertaking is lamentably ignorant or regardless of the best means of success.

For the Ladies, themselves, where is the mansion or the cottage in Hempstead, or its vicinity, that does not display more or less of that refinement which the love of flowers indicates: and which, when once it breaks out, spreads with a natural and wholesome contagiousness over a whole community, prompting all to unite in the Apostrophe—

"Soft roll your incense, herbs, and fruits and flowers,
In mingled clouds to *Him* whose sun exalts,
Whose breath perfumes you, and whose pencil paints.

And here the way opens for me to fall, for the occasion, into the track of one of my eloquent predecessors, though prudence would warn me not to call up in contrast with my own, the classical and brilliant performances of any one of those who have gone before me on similar occasions. Yet my sincere anxiety for the honor and prosperity of every one who lives by the plow, prompts me to quote for your recollection this remark of Hon. Senator DICKINSON, of New-York: "And is it not," said he, "lamentably true, that the extreme doctrine of rewards and punishments, which has practically obtained, by general consent, for the last few years, and has been upheld and justified by all parties who have had the dispensing of patronage, has done much, very much to withdraw men from the sober pursuits of industry, and induced them to embark their little all upon a sea of political troubles?—To forego the cultivation of the little farm, where peace and plenty are the sure rewards of industrious and frugal habits, to gain a precarious subsistence by hanging upon the skirts of party: politicians by trade, and office-seekers from principle. If," added he, "Government seeks to entrench itself about with office and patronage, and relies for its strength on its parasites and place-men, and not upon the affections of the people, it cannot win by its justice, though for a time it may terrify by its power." I mean no more than he did, to make any but a general application of these remarks. In more than a quarter of a century that I have been laboring with my pen in the cause of the plow, I can safely say that never has a word been penned, or by me been permitted to be published, of a partisan character; but I have lived long enough to see and to deplore the increasing disposition of young men to abandon industrial pursuits for a slavish dependence on the capricious breath of power: so that now, addressing myself to those who are themselves, and who desire their sons to be, *independent practical farmers*, I hold it to be my sacred duty to exhort you to discourage all such enervating and miserable inclinations. Rather cut off a small corner of your farm and persuade them to seek an honest livelihood, however homely, by the sweat of their brow.

In the best days of the Roman Republic, ere luxury had enervated her people—when

"The nerves that join'd their limbs were firm and strong,
Their life was healthy, and their age was long;

it was by the addition of *two acres* of land, that a country discharged its obligation to its heroes. The neat, well-tilled little farm of my friend Mr. LAING, would have recompensed the heroism of an Horatius Cocles, or the virtues of a Cato. Teach your son, then, rather to till his two acres, than give up his life to a wretched alternation of

hope and fear, of getting and losing place. Let him remember that "a plowman on his feet is taller than a courtier on his knees." If we are industrious we shall never starve, for at the workingman's door hunger looks in but dares not enter, as Poor Richard says. Tell him then to—

> "Plow deep, while sluggards sleep,
> And you shall have corn to sell and to keep."

In the spirit, if not in the very words of my estimable friend, Hon. ZADOCK PRATT, himself a working man of the first order of benevolence and usefulness, when some days since addressing the Greene County Agricultural Society—"At the first symptom" said he, "of that infatuation that would lead your son to sell his birthright for a mess of pottage, put into his hands the fable of the fat *town dog*, and the *lean wolf*."

The wolf expressing surprise at his sleek and comely appearance, was informed by the dog that if he would accompany him to town, he would put him in the way of faring equally well; but when they reached the suburbs of the city, he espied something on the dog's neck, and so with a mixture of curiosity and suspicion, he asked his companion what it meant. "Oh!" said the dog, "that's only a collar with which my master confines me through the day, and forces me to sleep, that he may the better secure my vigilance over his property at night." "Ah!" said the wolf, "if that's the price you pay for your good looks, good-bye to you, my friend:—I go back to the woods. When hunger seizes me by the throat, Liberty will come with her sweet smiles to console me."

That my most youthful hearers may the better understand the fable, I have caused it to be illustrated as you see.

Finally, Farmers of Long Island, how striking are your advantages, and how many the considerations that may well warrant you in being proud of your position! With a soil easi-

ly labored, and, when well fed, quick in its returns—in close proximity, and with every mode of communication by land and water, with half a million of consumers every day, and every hour increasing—with even a second farm in your great Southern Bay, affording seventy miles of inland navigation, inhabited like the lake in the happy valley of Abyssinia, with fish of every species, and every bird that nature hath taught to dip its wing in water; and superadded to all these a climate of uncommon salubrity, what more can you desire or deserve? And then, again, for moral stimulus, what community was ever looked down upon by a more devout, a braver, or a nobler ancestry? Ornaments of the church—sages who kindled and kept alive the council-fires of the Revolution, and heroes who bled in its battles by sea and land! with your own amiable and accomplished Historian to rescue their names from oblivion, until history itself shall be buried in the ruins of time, and the brightest and most lasting renown of the Hero and Patriot shall fade away even as the halo of the setting sun! But though the genius of destruction shall obliterate from the records of fame, even such names as Long Island's learned and amiable Mitchell, her gallant Truxton, and no less gallant but less fortunate Woodhull, who scorned to save his life with one word of disloyalty to his country—shall not the influence of their virtues pass from father to son, while this beautiful Island stands out from the bosom of the ocean?

Gentlemen,—and now I address myself exclusively to you—as I have already abused your patience, let me detain you but a moment to advert to and express my humble approval of one remarkable feature in your proceedings; you have wisely manifested your sensibility to the rights and influence of the softer sex, by appointing Lady Committees to award your premiums for objects coming peculiarly within their province—persevere in this direction. It was not a bad maxim of the eccentric and ill-fated Crockett, to be sure you are right, and then go ahead. But excuse me for suggesting that they should command our respect and attention on yet broader and higher and holier grounds. I have alluded to the sort of education fitted to unite the practical and the intellectual Farmer, and thus secure a race of those "high-minded men," who, after all, constitute a state. And shall I tell you how such men are to be secured?—No! gentlemen, you already anticipate me. It is by sound, and solid, and useful, and virtuous instruction *to your daughters*, who are to be the future mothers of the Republic—mothers whose holy office it will be to sow the first seeds in the virgin soil of youthful minds. They give inclination to the twig, and the tree is bent accordingly. Fear not that solid instruction will impair the delicacy, or blunt the nice moral tact which is the proud attribute of their sex, and the admiration of ours. Does not the flexile vine bear as much pruning and culture as the oak? No, my friends, ignorance—ignorance is the great fountain, ever teeming with corruption! Knowledge at once strengthens and refines the soul, as art gives to "valor's steel" all its virtue, its pliability, its temper, and its polish. But polished or unpolished—alike in the palace or the hut—for all the good offices I have named, an Indian or an African sun may have burned upon her, still the heart of woman, like the diamond in the mine, is substantially the same! Sensitive as the harp of Æolus, it has chords responsive to the faintest cry when distress is in the wind. When the gallant Capt. Smith was bound for the stake, and the torch was already lighted, whose tears melted at once the heart of the savage and the chains of the victim? When the ill-fated Park was dying in the African wilderness of exposure and famine, shunned by his own sex, and threatened by wild beasts not more savage in their nature, who led him fainting to their hut, appeased his hunger and assuaged his thirst, and sent him on his way refreshed and grateful?

In both cases untutored savages, but mark! in both cases *Women!*

> "O, Woman! in our hours of ease,
> Uncertain, coy, and hard to please,
> And variable as the shade
> By the light quivering aspen made;
> When pain and anguish wring the brow,
> A ministering angel thou."

WAKEFIELD.—*Guano as a Manure.*—At the meeting of this Club on August 15, H. Briggs, Esq. opened a discussion "On the beneficial effects of Guano as a Manure." He began by observing—I shall make a few observations, which I hope will provoke a discussion. Farm-yard Manure is thought to be the best manure—but this is certain, that that kind of manure is best which has most of the nutritive properties of food for plants in it. Now let us compare the analyzation of manure and guano: —

A ton of manure yields		2 lbs.	4 oz.	of potash.
Do.	guano do.	66 lbs.	8 oz.	do.
Do.	manure do.	1 lb.	10 oz.	soda.
Do.	guano do.	36 lbs.	15 oz.	do.
Do.	manure do.	5 lbs.	1 oz.	phosphoric acid.
Do.	guano do.	283 lbs.	9 oz.	do.
Do.	manure do.	1 lb.	4 oz.	sulphuric acid.
Do.	guano do.	93 lbs.	8 oz.	do.
Do.	manure do.	1 lb.	9 oz.	chlorine.
Do.	guano do.	62 lbs.		do.

From which it will be seen that one ton of guano contains about as much potash as thirty tons of manure. One ton of guano contains about as much soda as 19 tons of manure. One ton of guano contains about as much phosphoric acid as 55 tons of manure. One ton of guano contains about as much sulphuric acid as 80 tons of manure. One ton of guano contains about as much clorine as 45 tons of manure. Bones are said to be a valuable manure:—the principal fertilizing ingredients in bones are phosphoric acid and lime. Now, a ton of raw bones gives 580

lbs. of phosphoric acid. A ton of guano gives 283 lbs. of phosphoric acid. So that bones give double the phosphoric acid that guano does, but bones give no potash, soda, sulphuric acid, or chlorine; in yielding lime they are but equal. *Rape dust* contains no potash, soda, or sulphuric acid; so that if the land does not contain these, rape dust would be an inefficient or only partial manure, so far as the above three ingredients are concerned. There are only four manures which will do to be applied alone, viz: yard-manure, guano, night soil, and urine. The following are only partial manures:—soot, blood, bones, rape dust, and nitrate of soda. A comparison of night soil* and guano is as follows:—

A ton of night soil yields	6 lbs.	7 oz.	of potash.
Do. guano do.	66 lbs.	8 oz.	do.
Do. night soil do.	4 lbs.	10 oz.	soda.
Do. guano do.	36 lbs.	15 oz.	do.
Do. night soil do.	120 lbs.		phosphoric acid.
Do. guano do.	283 lbs.	9 oz.	do.

The comparative value of farm-yard manure and guano (leaving out the gaseous ingredients) appears to be this:—Guano is worth thirty times as much per ton as farm-yard manure, as far as solid fertilizing matters go. Practice confirms this—we have on our farm as good Turnips from less than five cwt. of guano per acre, as from twenty tons of farm-yard manure; but it may be asked, is it equally durable? I say more so—farm-yard manure it is admitted, yields more gaseous ingredients, but being very volatile, much more flies off than can possibly do from guano. On the ground we tried with 5 cwt. of guano for Turnips, and twenty tons farm-yard manure, the crops of Turnips were equal. The next crop, which was wheat, the part which was tilled with guano produced the best crop. There is a clear benefit to the farmer; he can raise more Turnips by the aid of guano, which gives him more food for his cattle, and of course makes more manure for him afterwards. The prices of guano vary—say Peruvian, £10 per ton. Ichaboe, £7 10s.; but I find there is not such a difference in their virtues, so that I conclude Ichaboe is the cheapest. I cannot omit observing that guano is also useful in killing worms when it is applied to Grass land; they may be seen in immense numbers on the surface, but I think guano should be mixed with salt. Mr. Farrer, of Oulton, said he applied guano last year, and there was less Grass in June on the part where the guano was put than on those parts where it was not sown; but when I mowed it in August it yielded five tons from four acres, and the fog or after Grass was perhaps the best in the neighborhood; the quality of the hay was very good. I have tried it for Turnips as follows:—I put 6 cwt. per acre of guano, and 20 tons of manure, a mixture of horse, pig, farm-yard, and night soil. I spread each on the ground, and plowed it up into ridges, sowing the Turnips on the top. The manured Turnips took the lead, and kept it until about ten days since; but now the guano has outgrown them. I also tried guano on four large patches of Grass, in one place particularly. The Grass was distinctly better the first and second year. Mr. Hislop.—I have not used it extensively, especially in its dry or powdered state, but made into a liquid, two ounces to a gallon of water. I have applied the liquid twice in the year to Carrots and cauliflowers. Its effects in killing the grubs on Carrots was wonderful, although next year it did not seem to do such execution on the vermin. When I tried 4 cwt. per acre with manure, the tops were greener, but no material difference in weight produced; but where I tried eight cwt. per acre, I had a bushel of Potatoes more in a row of eight chains long. On the crop of Barley the next year I observed a want of freshness where the guano had been sown. Where I sowed it on Grass last year, it did very poorly, but this year it shows clearly its beneficial effects.—The members came to the following resolution:—"That, in the opinion of this meeting, guano is an important auxiliary to the resources of the farmer in obtaining luxuriant crops, and is the cheapest and most important substitute for farm-yard manure, in some instances being found to produce as good crops at half the cost."

* This night soil includes the urine with it.

AN ADDRESS

To the Agriculturists of Great Britain, explaining the Principles and Use of his Artificial Manures. By Professor Justus Liebig. Muspratt & Co., Liverpool, Manufacturers of the Manure.

"TWENTY-FIVE years ago, when the manufacture of spa and mineral waters began, they met with violent opposition from the members of the faculty, as being deprived of all the good qualities of the natural ones—as wanting, in a certain *conditio, sine qua non*—in a *spiritus rector*, or vital power, which alone gave them any medicinal qualities. Those times have passed now—chemistry has demonstrated to a certainty what the constituents of those various waters are, and under what forms and compounds they are united in them. It has succeeded in combining them exactly in the same proportions, and in rendering them not only equal to to the natural ones, but even more effective. Only from that time, physicians were induced to connect certain effects on the human body with certain elements in the waters, and were enabled, by the light of science, to add more of this element, or more of that; nay, to apply, instead of the waters themselves, the one active element alone, as is, for instance, the case with iodine in indurations and struma. It is well known, that at this moment there are extensive manufactures of mineral waters in England, at Berlin, at Dresden, at Vienna, &c."

The above is a paragraph with which Dr. Liebig commences a chapter on artificial manures in this pamphlet, and the application of the fact thus broached to the subject he discusses is very easy.

"I believe," he says, at p. 23, "that the same principle may be applied, partially, at least, to the use of manufactured manures, which, in England, has just been called into existence. Guano, that powerful manure, the efficacy of which, in a judicious application, has been clearly demonstrated by the testimony of the most intelligent farmers, cannot be supplied for a much longer period, because the rich stores in Chili and Africa must be shortly exhausted. As it is only in very dry countries that it is found, we cannot expect to discover many more places containing it, and what are we then to do? My attention has often been directed to the question, whether, according to our experience, and the present state of science, a manure might not be composed which could replace the genuine guano in its effects, and whether I could not, by a series of experiments, point out a way of preparing one equal to it in all its chemical and physical properties."

The fact that guano, like the mineral water, occurring in nature, may be advantageously replaced by artificial preparations, has long been acknowledged. Such a manure, "applicable to all descriptions of soils," should contain, according to Professor Liebig, earthy and alkaline phosphates, the alkalies, sulphate, muriate of potash, common salt, salts of lime, especially gypsum, and salts of ammonia. *The proportion*, however, in which these should occur in manure must differ according to the crop it is to be applied to; for—and this is a fact which has been illustrated to a great extent during the past few years, and to which, doubtless, the attention of chemists will be devoted for many years to come—the mineral food required by one plant is different from that needed by another.

"Hundred weights of the ashes of the following plants, contain—

	Straw of				Ashes of Hay.
	Beans	Peas	Potatoes.	Clover.	
Alkaline Carbonates.	22.38	12.43	4.34	31.63	3.0
Carbonate of Lime.	39.50	47.81	43.68	41.61	6.9
Phosphate of Lime.	6.43	5.15	5.73	11.80	40.8
Phos. of Magnesia...	6.66	4.37	7.82	0.91	
Sulphate of Potash or Soda.....	12.40	10.15	.....	2.23	8.84
Magnesia.....	.....	.....	.....	.....	21.8
Chloride of Sodium or potassium,	0.28	4.63	2.8	2.27	3.06
Ph. of Iron, Ph. of Alumina, &c...	.....	.....	.....	.....	1.27

"In these analyses Silica has not been taken into account, as it is found in all soils, and need not be supplied. One hundred weight of the ashes of Potatoes, and the seeds of the following plants, contains—

	Potatoes.	Wheat.	Beans (Vicia faba.)
Alkaline Phosphates.	15.75	52.98	68.59
Phosphate of Lime and Magnesia....	9.00	38.02	28.46
Phosphate of Iron....	0.20	0.67	0.00
Sulphate of Potash...	15.07	0.00	1.84
Carbonate of potash and Soda...	51.70	0.00	0.00

"What is wanting of the 100 in the above analyses is sand, coal, or loss. From these researches it appears, that for stalks and leaves we require other elements than for seeds. The former contain no alkaline phosphates, but they require for their development and growth, a rich supply of alkaline carbonates and sulphates. On the other hand, the carbonates are entirely wanting in the seeds, which, however, are very rich in phosphates. It is sufficiently obvious that a rational farmer must supply both, as well as all the others. If he supplies only phosphates, and does not restore the alkaline carbonates, his soil will become gradually barren—it will be exhausted in those necessary elements for the development of stalks and seeds, without which no formation of seed can be expected. If he supplies the alkalies, lime, and sulphates alone, in a given time he will get no more grain. All constituents of the manure, if they are supplied alone, have this great defect, that by them the soil is impoverished in other equally important substances. No one of itself can maintain the fertility."

The theory of artificial manuring seems to be now perfect; but it is questionable, if a perfect practice can yet be founded upon it. What we want to enable this, is a perfect knowledge of the mineral and organic constituents of plants, and *that* we do not yet possess, as any one may ascertain by comparing the statements of chemists on that head. However, Professor Liebig is certainly one of the best existing authorities on the subject; and, if in the present stage of chemistry in its application to agriculture, farmers are to trust to chemists at all, we know not to whom they should give more of their confidence than to him. He has prepared prescriptions for manures to be used for the different cultivated plants, and he has intrusted the execution of them, under competent superintendence, to Messrs. Muspratt of Liverpool.

There is much very useful information in this pamphlet which these gentlemen are circulating as an advertisement of their connection with Professor Liebig, and which will doubtless interest the reader even though he should not test its accuracy by the purchase and use of Professor Liebig's manure. In saying this, we do not mean to cast any doubt upon the soundness of the principles on which this manure is prepared—that is unquestionable—but there may be variable circumstances connected with the action of manures with which we are yet unacquainted. Certain it is, that though we may know how to manufacture a successful manure, we have not yet the means of making a perfectly economical one. Ability to adopt true *economy* in the art of manuring, depends not only on a knowledge of what plants require in order to their full development in all the different stages of their growth; but also on a knowledge which we do not possess, of the stores which Nature has ready for their use, both in any particular soil and in the air. It would be wasteful to supply them with all they want independently of these.

[London Agricultural Gazette, Sept. 20, 1845.

THE GIANT OX.—This noble and extraordinary animal of the Devon breed, of which we have several times spoken—nineteen hands high, and upwards of 3,700 pounds weight—was disposed of by raffle, on Friday last, at Pratt's Old London Inn, in this city. There were 120 subscribers at a guinea per share, and it was agreed that the last ticket drawn should be the prize ticket, or in other words, the person to whose lot it fell, should be the winner of the giant ox. 118 tickets had been drawn, and the subscribers whose tickets had not been drawn, were—Mr. Burgoin, of Sowton, bailiff and hind to John Garratt, Esq. of Bishop's Court, and Mr. Hodge of Plymouth, horse dealer, who was represented by deputy. These now agreed to go shares, and consequently the ox is theirs. The winner had to spend £5, and those by whom the ox was put up, a similar sum. [Taunton Courier.

RED DEER.—It is well known that the red deer in some districts arrive at a larger size than in others. As an instance, we have just heard of two magnificent stags, lately killed in Ardgour, of the respective weights of 408 lbs. and 353 lbs., as killed. When cleaned, including skin, head, and horns, they weighed 335 lbs. and 295 lbs. The fat on the haunches of these animals measures in depth above three inches. The head of the smallest, though not so fine a head as the former, has twelve good points; the other ten. [Inverness Cour.

WINE MAKING,

AS PRACTICED IN NORTH-CAROLINA, BY REV. S. WELLER.

Addressed to Doctor D. P. GARDINER, Chairman of the Executive Committee of the American Agricultural Association. Read at a meeting of the Association, and communicated for publication in the Farmers' Library, at the request of the Editor.

A PORTION of the grapes on the trellises and arbors being fully ripe, then comes the vintner's harvest. And the busy scene is presented us of visitors in the vineyards (the uninvited having paid their entrance fee) plucking and eating the beautiful, healthful fruit, and the grape-gatherers collecting for wine or table use.

Our grape gathering is in a very plain way—though that of the Scuppernong is somewhat peculiar. For gathering this kind, a large sheet or piece of cloth, with poles fastened to each end or two sides, is held by a couple of hands under any part of a canopy; and another, with a forked stick, shakes the branches above the canopy, and all the ripe grapes fall and roll into the middle of the cloth. Other kinds of grapes are plucked off by hand, while the gatherers stand on movable fixtures, to enable them to reach the grapes hanging underneath high canopies, or on the highest parts of the trellises.

The grapes are carried to the presses, where all are arranged with a strict regard to order and cleanliness. First, all but the ripe and sound berries are separated, if necessary. Next, they are passed through a machine for mashing them, consisting of a frame placed on a vat or half-hogshead, with two turned rollers (and hopper above) so adjusted as to distance, as not to break the seeds of the fruit. To one end of each roller is a handle, by which two persons turn, and a third feeding through the hopper, enough grapes for 20 barrels of wine may be mashed in a day.

Grape gathering commences here toward the last of July, and continues till October.

From about twenty varieties only I make wine as yet: though more than a hundred others, bearing small quantities, and different kinds ripening in succession, gives me time to operate in wine-making as an incidental employment.

Four or five hands, large and small, can make their barrel or more of wine a day. It is important for all the wine in one vessel to be made of grapes gathered within the period of, at most, two days. The Scuppernong vine ripens its berries in succession, and requires repeated gatherings, therefore, by shaking, as before described, under the same vine or canopy. And, in consequence of thus ripening, we have its most delightful, healthy fruit, commonly from the first of August till the first of October.

Some other kinds of vines ripen all their berries at one time; and there is, therefore, no trouble in separating the green ones before mashing the ripe. My Halifax is remarkable for this property. All the fruit on each of its large clusters turns a dark blue at the same time; and a few weeks thereafter, being fully ripe, they are fit at once, after pulling off, for the compression, or table use. The Norton Virginia Seedling clusters are not altogether free from green berries. The Cunningham has, on every cluster, more or less green dwarfish berries, when all the rest on the cluster are fully ripe. This last is especially excellent as an eating fruit, but for wine the above circumstance is rather an objection. Yet there is no additional trouble on this score by the late Mr. Herbemont's favorite method, of making a very superior white wine out of a dark-colored grape, as he details in his short treatise on vineyards.—The process is that of putting the grapes, without mashing, under the press, when the fully-ripe berries only are broken, and have their juice expressed; while the green or unripe ones, on examination after pressing, are found whole. These last, or all the refuse, may be put through the mashing machine and pressed for an inferior wine, vinegar, or distillation. But the juice of the ripe fruit only has added to it the requisite quantity of sugar or brandy, and put into the cask to undergo the very slight fermentation that soon converts it into a very sweet, pleasant, and peculiarly healthful wine.

Through the above process I make wines, quite colorless, from several kinds of dark-colored grapes, that otherwise, or by fermenting with the skins, (which gives the coloring,) would be a lighter or darker red, according to the period of fermentation. I frequently manage my Halifax in this way, and the wine thus made cannot be distinguished from the colorless Scuppernong as to its appearance; though when this kind is fermented in the must, it is of a brilliant red hue.

I state here that the Isabella is particularly remarkable, in this region, for ripening its fruit at successive periods; that is, in seasons when,

in despite of the propensity to rot, the fruit matures at all in any quantity. The Catawba, also, is somewhat prone here to have its berries ripen successively on the same cluster. The Vine Arbor, like my Halifax, all ripen at the same time. So do most others that I have cultivated to any extent; as the York Madeira, Lenoir, Somerville, and Norton's Virginia Seedling.

Here it may be proper to observe that the quantity of juice, in proportion to the quantity of grapes, varies pretty much in proportion to the size of the berries, though there are some exceptions thereto. The Scuppernong is one of the largest of grape fruit. I have frequently singled out the largest berries of a quantity gathered, that individually measured three and a half inches in circumference. Years since, one was found in my vineyards that measured four inches round; but this was quite extraordinary, and appeared more like an apple than a grape; and, by certificate, stating its dimensions, in the "American Farmer," I challenged its equal. But none as yet, I believe, has been found.

The Scuppernong fruit being large, free from stems, and very juicy, it is common to press four gallons of juice out of a bushel of grapes: from the Norton, Vine Arbor, my Halifax, and some other large-fruited, about three and a half gallons. While those of very small berry, like the Elsingburgh, and those of wild growth, or woods grapes, as called here, (of which there is a great variety in North-Carolina,) do not average but about two gallons of juice per bushel.—And besides being generally surer and better bearers, and more easily gathered in quantities, the large-fruited grapes are free from attacks of birds—for, it would appear, their bills are too small to grasp them. However, a little use of powder and small shot soon frees a vineyard from the visitation of birds.

But to return from this digression to the wine press. The grapes being mashed, there are several ways of treating the mass, or must, according to the kinds of wine designed. But, not to exceed limits too much in this, I must defer treating of these for another letter.

You desire, you say, that in particular I should give our method of making wine in North-Carolina. I have to first remark that the methods in this State are various, according to the tastes and circumstances of the makers. But before stating some of that diversity, as pursued by myself and others, I will give the process that has uniformly succeeded with me in producing a good wine, that never spoils, and improves by age, though excellent in a few months. The secret of this process (a little diversified, as I shall presently show) is that of giving the wine a good body at once, by adding enough of sugar or brandy to make up for the general deficiency of American grapes in saccharine or other matter, and, therefore, to prevent the acetous fermentation, especially in our hot climate. Indeed, in the warmest season of the year South, (where deep, cool cellars are also scarce,) there is no certainty, it would appear from my experience and information, of a *safe* issue of fermentation, even with a sufficient ingredient added, for a good body or strength to the wine, unless, also, recourse be had, otherwise and previously, to separating some, at least, of the extraneous matter.

For this end, after having tried various methods, as that of passing the juice, after pressing, through clean washed sand, (a troublesome affair,) I have found that folds of a woolen or flannel blanket answer every desired purpose, and are attended with the least trouble.

The following is the plain, simple and continued process of making our Scuppernong wine: After our grapes are mashed by our roller machine, before described, and the mass folded in a sheet, inside of a crib of upright laths, under a press, and the juice expressed in the manner of cider making, several folds of a woolen blanket laid on a frame, over a vessel or tub, strain out, as the juice passes through from the press, most of the extraneous matter; and, thus purified in part, to it is added two pounds, or more, of sugar to the gallon, or a portion—say a fourth—of good brandy or spirits. After being put into a clean cask, fumigated with a sulphur match, and shaken well, the cask is bunged up, and put away in a cool place or cellar. No farther process is required. A gentle fermentation will ensue; and in the succeeding fall or winter, if choosing to rack the wine, it will be found to be clear, without artificial fining, and can be drawn off so from the lees, by a spigot at a sufficient distance from the lower part of the cask. At the bottom of the cask will be found a gallon or so of dregs or lees. I say if *choosing* to rack; for the wine may be kept safely any length of time on what lees there are. And occasionally it may be drawn off as wanted by a spigot above the lees. If wishing a superior article of what may be called the Scuppernong Champagne, doubly refined sugar of the best quality is to be used.

Wines of colored or other grapes may be successfully made in the same manner as above stated for the Scuppernong. And if colored grapes are mashed, the juice will have a slight color, and be a sweeter wine than that which is regularly fermented with the skins, &c. But if a wine not so sweet and highly colored be desired, I put the mashed ingredients into an open-headed cask, covered with a blanket, allow it to ferment till the skins of the grapes and other ex-

taneous matter float on the surface of the mass; then by a spigot near the bottom, I draw off the clear juice, and, steaming it through folds of a woolen blanket, as above stated, I add forthwith the sugar or spirits; after this, treatment in the cask, as before stated. But when I wish to make a white or colorless wine, from colored grapes, I pursue the same plan as first named, with the exception of gathering the grapes in the morning, ere the sun heats the skins and tinges the juice, and without mashing the grapes. By putting them under the press whole, those fully ripe only, after pressing, will be found broken. Those not broken may be mashed for an inferior wine or vinegar; and, also, when the clear juice is drawn off, in case of fermentation, with the skins in the open-headed cask, the rest may be pressed for the like purpose.

Once I tried the plan of fermenting with the sugar or brandy added, under the impression of making a more homogeneous liquor thereby; but I found no advantage in the way anticipated, and that it was difficult to arrest the fermentation after drawing off; and, not unfrequently, the wine would, in spite of efforts to save it, run into the acetous fermentation.

The foregoing process of wine-making I have found attended with uniform success, and the wines made thereby have been pronounced, by most competent judges, excellent in all respects.

A very good Champagne kind of wine can be made by bottling the Scuppernong, or other kinds of juice, after straining as before directed, and putting it up at once in strong Champagne bottles, corked and wired.

A remark or two in allusion to a few circumstances in the foregoing methods of wine-making:

1. The folds of woolen blanket will repeatedly become clogged with the extraneous matter, and (especially if the grapes are very ripe) the blanket must be washed or exchanged several times in making a barrel of wine.

2. Again: when racking, the cask into which the wine is again turned must be well fumigated with a brimstone match—say a strip of cloth dipped in melted sulphur, and set on fire, and on a thin wire put into the middle of the cask, and the bung put in for a short time ere turning the wine therein.

I find, by carefully straining, as stated, and putting the requisite quantity of the preserving ingredient, (the quantity depends measurably on the kinds and ripeness of the grapes, &c.) it is not material whether the cask be filled up, or whether different quantities be put into it on successive days; though it is well to fill each cask at once, if convenient. If the spot where it is placed be kept dark, the better for the safe-keeping and improvement of the wine.

I do not think it worth while to detail other methods of wine-making in our State, for the above I have found safe, easy, and effectual, for a good wine; and others I have tried without uniform success, and with considerable loss.

Of course, the better the sugar or brandy, the less required to the gallon of juice to insure the keeping. I was once told that one-seventh of brandy was sufficient, but experience has shown me that a fourth is the medium quantity of spirits. I have tried putting in less than two pounds of sugar when making a sugared wine; if less is used, the juice or must should float an egg. But this I found of somewhat doubtful issue. I have tried putting in the keeping ingredients at different periods in the same cask as found needful, but conclude it is decidedly best to put in plenty at once. Yet, in some instances, I have saved or recovered injured wine by adding more sugar or brandy.

With the juice of well-ripened grapes, strained as before stated, and one-third good spirits and two pounds of doubly-refined sugar added to the gallon, a most pleasant, healthful and medicinal cordial is made, according to trials and opinions of the best judges of the quality of cordials.

As to wines, however, I have found it best to use either sugar or spirits, and not both at once or for the same article.

Colorless wines may have any shades of red color imparted to them by smaller or larger proportions of scorched sugar or baked apples put into the cask. But sugared wines must, if it is deemed proper to resort thereto, be colored with sugar and brandied with apples, or the unity of taste is injured. But I deem it best, in general, to let the white wines remain so. In short, as to selection of grapes and materials, and the process of turning their *quintessence* into wines, (I have utterly failed in attempts to make raisins, though not in preserving grapes for months,) much depends on the pains taken, as well as on other matters, as to degrees of excellence and value of the wines. And therefore, of right, prices vary, in my establishment, from $15 to $50 per barrel. Hence, too, I presume, the diversity of prices in the East. And as an instance of diversity of treatment there, I have been credibly informed that, ere shipping the celebrated Port wine, for safe-keeping on the voyage, &c., they add one-third of good brandy.

I beg leave to add that, in the midst of a press of cares and employment, I have now finished (I fear, though, in a very imperfect manner,) my third and last number on the subjects you suggested. That yourself and co-partners, in advancing the benign cause of American Agriculture, in its diversified branches, may have the happiness of seeing so good an undertaking prosper in your hands, is my sincere desire.

NOTES ON THE PRECEDING,

MADE AT THE INSTANCE OF THE EDITOR BY COL. EDWARD CLARK, OF BROOKLYN, N. Y.

Hon. JOHN S. SKINNER,
Editor of the Farmers' Library.

Dear Sir—I have read, with much satisfaction, Mr. Sidney Weller's various processes for making wines of various qualities. They may answer a valuable purpose in North-Carolina, and in the Southern States, or wherever the grapes, generally speaking, are gathered from uncultivated or unpruned grape-vines. Under such circumstances, the juices of the fruit are not sufficiently concentrated; or, in other words, the sugar or sweet principle is not sufficiently developed, and artificial means become necessary to preserve the wines produced from grapes so collected.

Ordinarily, common brown sugar or unrectified alcohol are added to the juice of the grape before, or sometimes after, fermentation, or the development of alcohol, with a view to produce a homogeneous beverage; but in every instance this practice must fail of its object, because the flavoring properties of the vegetable from which they have been produced will more or less prevail, and vitiate that of the juice of the grape, in proportion to the rate with which the adulteration has been made.

If the juices of the grape have not been sufficiently concentrated, and additions of convertible alcoholic materials become necessary for its preservation, then refined sugar or rectified alcohol may be added to the grape juice previously to its fermentation, in proportion to its poverty and the strength or quality of the wine desired; if a dry wine, a less quantity—if a sweet, a greater. But it should always be understood that such additions, no matter how well refined or rectified, or well fermented, deteriorate the flavor.

In cases where grape vines are closely pruned, the secreted juices become concentrated, and sugar, to excess, is formed in the ripe grapes. And, from such, raisins are formed by drying; or if juice be expressed from them, with regard to the object, not only strong dry, but sweet wines, are obtained, that will, with proper treatment, keep in improving excellence for a great length of time.

Should not a sufficiency of alcohol be developed by the fermentation of the grape juice, then from five to seven per cent. of good peach brandy may be added. It may here be remarked, an ample supply of leaven or native yeast is contained in the grape juice, to cause fermentation; in fact, there is a superabundance of it, which should be suffered to escape from the bung-hole of the fermenting vessel, by keeping it constantly full—that is, if a sweet wine be wanted. Otherwise, the cask should not be full, and the feculent matter which rises to the top of the liquor may be permitted to partially subside; when the cask should be filled and closely stopped, but be daily watched to ascertain whether the vinous is running into the acetic fermentation. Should such be the fact, the liquor must be immediately racked off, or refined, in casks that have been previously sulphured; which is performed by introducing a small piece of cloth, fastened to a piece of wood, dipped in fused sulphur and ignited, and then thrust into the bung-hole. When it ceases to burn, it is to be withdrawn, and the cask tightly closed. So prepared, the wine is to be put into the cask, and all connection with the air cut off. The liquor has still to be watched, and, if it has an acid tendency, it will be necessary to repeat the sulphuring or racking process. Should the wines so treated have become acid, a small quantity of limestone or chalk may be added, say sufficient to neutralize it. If the wine be very acid, and it be attempted to correct it by the addition of limestone, and a large quantity be added, it will impart a slightly bitter, though not unhealthy taste, which is not found except in wines of inferior quality. A very important arrangement for the preservation of wines, and preventing the removal of the fermentation, is their stowage in *deep cool cellars*.

If attention be paid to the foregoing remarks, many of the difficulties which present themselves in the manufacture of wines, by the ordinary processes practiced in our country, will be avoided. But a considerably large book might be written on this subject, and then much would remain to be learned before the whole art of making good wine could be reduced to practice, even by the scientific cultivators of grapes and the treatment of the vintage. I hope the few hints thus hastily presented may prove of some service in directing those who are turning their attention to this important branch of our Agriculture.

With great respect, I am
Your friend and ob't serv't,
EDWARD CLARK.

Brooklyn, Oct. 9, 1845.

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We understand that in Madeira the most alcohol ever added is ten per cent! [*Ed. Farm. Lib.*

FARM REGISTERS....HOW KEPT, AND USE OF.

We do not design to write an essay on the obligation and usefulness of keeping *Farm Registers;* the thing is too apparent to require argument or elucidation, and if the true secret could be known, the explanation of the reasons of those who omit to keep such Registers and to note their daily transactions, would be found to be the result of ignorance or indolence; and it is not easy to say which is the more disgraceful of the two. Surely it would be easy to call up the manager or head laborer at night, and from his account make a brief entry of the work that had been done—the articles sold and bought, and the prices obtained and paid.

A merchant on the smallest scale, keeps his books as indispensable to enable him to judge whether he is going backward or going ahead in his business; while, as we fear, a very large proportion of the Farmers and Planters in the United States keep no sort of books whatever, whereas, it ought to constitute, in the judgment and esteem of every man of good sense, not only a high point of duty, but one of his *recreations*—for the want of which, men take to snoozing or drinking, or electioneering, or card-playing. Where there is a son in the family old enough, (and if not a son, the daughter,) he should be trained to keeping the Farm Register.

One establishment on which this thing is done with unfailing punctuality and exactness, is the "Indian Hill" Premium Farm of Massachusetts, and we are not without a violent suspicion, that it was a view of the Farm Register and accounts, which contributed to the distinction awarded to the proprietor, as much as practical excellence or extraordinary productiveness in the management of the Farm.

It would give us pleasure to present a view of that truly curious, antique and venerable mansion and grounds, together with the accounts of management and products, so well and fully published from time to time in that useful Journal, the N. E. Farmer. But our present purpose is to give an extract from the farm book of Mr. Harold of Long Island; who, while he *takes the lead* in all work on his farm, keeps an exact Register, as well of Thermometrical and Barometrical as of practical observations and operations every day. The notes which follow, are selected not for any thing particularly striking they contain, but merely to show the *manner* of doing the thing. For, after all, we have observed that no explanation is so good as this sort of *demonstration.* It is here seen that in all time to come he can turn back and see how the force on his farm was occupied any day in the year, and what course of manuring and cultivation any and every part of his farm has undergone. We give it only as an *example—a leaf from a book!*

Copy of Farm Journal *kept by* John Harold, *Foster's Meadow, Hempstead, Long Island,* 1844:

April 24. Marked out corn ground; planted Mercer potatoes round do.; commenced planting corn; heard the Whip-po-wil the first time this spring.

25th. Burned butts of posts, and commenced setting picket fence; planting corn; fine day.

26th. Finished planting corn; planted white dumpling beans; stuck and hoed peas in garden; painted roof of wagon-house; making picket fence.

27th. Carted 12 two-horse wagon loads manure from yard; finished picket fence; planted beans.

29th. Pulled up mullen from grass ground; potatoes coming up in garden, (planted 28th March;) whitewashed fences.

30th. Done up carpenter's jobs; planted potatoes, sugar corn, squash and pumpkin seeds; planted out lettuce; sowed Cantelope melon seeds in frame; barometer down.

May 1. Painted wagon; white-washed chicken house; rain most of the day.

2. Hoed up potatoes; planted out egg plants; turned manure; added 10 lbs. Sulphate of Ammonia.

December 31. Remarks and condition of lots.

Lot 1. Orchard.—Orchard grass and clover cut for soiling and hay, part for garden purposes. Peach trees stand well in bearing, much improved by washing with soft soap, and tarring about the roots and digging in swamp muck; small trees dug round to keep grass away; native sort of peas succeed best.

Lot 2. Timothy and clover put down with wheat and rye; on rye part not so well taken, I presume from the rye standing too thick, and falling down; fed off in the fall.

Lot 3. Timothy and clover second time of mowing the part mentioned last year as poor and full of weeds; much improved by a dressing of guano and silicate of soda; mowed nearly as much again as last year.

Lot 4. Same as before, dressed in the same way.

Lot. 5. Part of this lot has been mowed four years; dressed it with guano and silicate of soda; mowed better than any time before; part oat, a good crop weighing 40 lbs. per bushel.

Lot 6. Part new mowing ground from wheat, part pumpkin patch; 1¼ acres corn, 8 rowed white flint, from which was husked 252 piled up bushels of ears, from manure made see April 2d, which was coarse cow-yard manure mixed with sulphate of ammonia, sulphate of soda, lime

and charcoal; this corn was extremely sound; part of the lot had sedge-hay plowed in, part old corn stumps burned up and spread over, which part was decidedly best.

South Farm. Just purchased; the land has had no manure for seven years; part of this was planted with yellow corn on June 4th, and manured as follows: 14 loads of very coarse stuff was carted out on May 11th, to which was added lime, ground bone and sulphate of ammonia, and wetted with a solution of sulphate of soda; cut up on Sept. 25th, and yielded nearly three times as much as the same quantity of ground planted to yellow corn in the same lot; planted two weeks before; but with common yard manure, from experience I find the addition of lime, ground bone, and sulphate of ammonia, converts our common yard manure into a valuable compost, requiring much less quantity in the hill or on the ground, and producing nearly as much again; this I find by repeated experiments, and at small cost; 100 lbs. of sulphate of ammonia, at a cost of $8, lasting me for all my manure heaps for a year, with 2 horses and 3 cows and 3 hogs. I have made 110 two-horse wagon loads of good manure, adding any rough stuff I could scrape together, and each load when well-rotted, sufficiently to plow under, weighed not less than 20 cwt. each. My plan is to make up my heap: on the top, spead fine charcoal and sulphate of lime, and cover it up with soil; in 12 to 18 days I have found it sufficiently fine to use.

PETZHOLDT AND LIEBIG.

REMARKS ON THEIR IDEAS IN RELATION TO GREEN CROPS.

To the Editor of the Farmers' Library:

Sir: I have been much pleased in looking over your periodical with the extensive range of subjects relating to Agriculture that you propose to keep the public informed on, and it is with the hope that yourself or some one as capable, may afford the desired information, that I submit the following remarks.

A perusal of Petzholdt's lectures, while it places in relief the views of Liebig, and presents clearly to us several true principles, certainly suggests many defects, both in the lectures themselves and in the chemistry of Agriculture, and our reliance on the certainty of chemical deductions has been much diminished by fallacies, as they seem to us, in his reasoning. The definition of *soil*, for example, would have answered his own argument better, had he considered it a medium to supply inorganic nourishment and support to the plant. This would have included the ocean, which, by his own showing, and by the analysis of others, contains all the elements, mineral and gaseous, necessary to the growth of its numerous vegetable tribes. These elements are soluble, and, therefore, is the sea the most perfect soil, because the nourishment it contains is in a complete state for the assimilation of vegetable life; in the very state, to which a scientific Agriculture endeavors to reduce annually, a part of the super-stratum of the earth.

His ideas, in relation to green crops, are more extreme, if possible, than Liebig's; and, if true, should forever discourage any attempts at adding humus to the soil; unless when the farmer has sufficient capital to resort to other methods; or if any should be tried, clover, and clover only, inasmuch as all other green crops require too much cultivation to pay their expense, or their roots do not penetrate far enough into the subsoil, to draw its constituents up to the soil proper. Yet this last consideration has been vindicated by experience, since it was first proposed, a hundred years ago. And I apprehend few persons have given a fair trial to other green crops, on a soil deficient in humus, but are satisfied that it is better to employ them, than to wait for the disintegrating influence of time and frost. Very few are the American agriculturists who have a knowledge of Chemistry, who do not think, with Liebig himself, that plants differ in their growth, according to the scarcity or abundance of humus in the soil.

It is evident that the disintegrating power of the plant itself, is left wholly out of account, and consequently that plants are merely passive with respect to the soil. But calculate the amount of inorganic constituents taken from the soil by several exhausting crops, and, we doubt not, you will find it far exceeds the amount fitted for assimilation by the agencies of air and water, and to this will a proper system of rotation in some measure have reference.

It is a great defect in the present system of organic chemistry, that the agriculturist has no accessible means of determining the exhausting power of his crops. It will not, I suppose, be answered, that the per cent. of ashes of plants is determined. I find that chemists differ very widely in respect to this; and I find that the diversity becomes still more evident, when of these ashes we wish to calculate the component parts. I notice a remarkable agreement in the analyses of wheat, pp. 69 and 70, and of that alone. But I would know, when we reap 10 bushels of a particular species of

wheat from an acre, weight 62 lbs. to the bushel, and averaging, say 40 grains to the head, how much of its several constituent salts is thereby taken from the soils, and how much of these must be replaced. I will suppose given for the solution of this problem, the analysis of the soil as accurate as may be, the usually observed meteorological phenomena, and any other data it may be in the power of a practical man to furnish. I think such a problem as this within the scope of a JACKSON or DANA to investigate. I conceive that a close relation will be found between the nitrogen assimilated by any plant, and some inorganic constituent (alkali?) required to feed it. I conceive, also, that the soil and atmosphere exert a reciprocal influence on each other; a full supply of *soluble* mineral salts causing, in the plant, a larger appropriation of carbonic acid and ammonia, and when the former are wanting, favorable weather may impart such vigor to the plant, as to enable it to decompose the soil.

Passing by many other points, I would only remark in our author's use of marl. Will not the planters of this peninsula acknowledge the beneficial effects of a layer of marl, only one half an inch thick, 1-24 of his amount?

St. Mary's Co. Md. LOWOOD.

THE FARMERS' LIBRARY IN DELAWARE—MEDITERRANEAN WHEAT.

Extract of a letter to the Editor from the President of the New-Castle Agricultural Society, giving an account of their late meeting, and sowing Wheat early among Corn.

WILMINGTON, Sept. 20, 1845.

ON the subject of the "Farmers' Library," I have not heretofore had time to write you. I will now say it exceeds my most sanguine expectations, and is every thing the farming interest could desire in this or any other country. You will soon have a number of subscribers in this County, through your agents here. Several copies have been ordered by our Society. I shall in a week or two be at more leisure, and will do all in my power to promote the circulation of the "Library" in this quarter. Now that you have the command of an extensively circulated journal, I wish to draw your attention to the practice of Mr. Joseph Hossinger of this County, *seeding Mediterranean wheat amongst corn*—communicated to me as President of our Society, and which was so satisfactorily received last year, that about 500 acres were thus put in, and with *complete success*—this year twice or thrice as much, and yet this method is not known as it deserves to be. Mr. Hossinger's plan is to manure his land that he intends for wheat, well in the Spring, and put it in corn, and in the last plowing in July or first of August, to seed it with Mediterranean wheat—cut the corn off and stack it as usual—tho' more open at bottom, to admit air and light; and then husk the corn when it is dry enough to house, and haul off the corn fodder—the growing wheat is not injured by stacking the corn on it in this way. The product has been from 20 to 39 bushels of wheat per acre—a good corn crop, and a saving of expense of fall plowing, &c. Experience in this latitude with this variety of wheat, shows also that it may be seeded much earlier than was supposed, and with a certainty of procuring a good crop. Nothing has astonished several gentlemen from wheat districts, in riding with me lately, more than the green fields of wheat among corn, after the manner of my friend Hossinger, and were surprised that this Delaware practice was not generally known in so important a matter as the *production of wheat.*

As ever, truly your friend,
JAMES W. THOMSON.

ENTOMOLOGY.

[Editorial Correspondence.]

To JOHN S. SKINNER, *Esq:* Your discourse on insects in the second number of the Monthly Journal of Agriculture is what most farmers very much need. There is great ignorance prevalent on the subject of destructive insects. Few are able now to distinguish their friends from their foes. "What! friends among insects!" some one will say, "I thought all insects were enemies to vegetation, and should be destroyed without much discrimination." If any think so they are in error, for many insects are carnivorous, living on other insects, and doing injury to no vegetable production. All persons have noticed the swift-running, dark-colored beetles in their gardens and fields. In the day time they may be found under stones and boards, or in the thick grass. These insects should be protected, for they destroy vast numbers of grubs and caterpillars, that live in or near the ground. They destroy them in the larvæ-state as well as in the perfect state. They have been known to eat up the cut-worm at the root of a cabbage-plant—but the gardener seeing the plant destroyed, and after digging finding nothing but the insect destroyer, has taken this to be the enemy, and crushed him forthwith. Many vegetable benefactors have thus been exterminated, for want of a little entomological knowledge.

But I am not about to write a long letter on this subject. My object is to commend to your notice a work "on insects that are injurious to vegetation," by Dr. T. W. Harris, of Cambridge, Mass. It was published in 1841, agreeably to an order of the Legislature. Although it professedly treats of the insects of Massachusetts, still it will prove a useful book in the hands of

any intelligent farmer in any State of our Union. It is a work of some 460 pages, written in a chaste, clear style, and freed as much as possible from technical terms.* Dr. Harris's Report will prove a great help to those who have little time for such investigations, for he not only describes such insects as are injurious to vegetation, but points out the best modes of checking their ravages.

Yours respectfully,

S. W. LEONARD.

Dublin, N. H.

MANAGEMENT OF BEES.—Having tried, during a period of twenty-seven years, all the different systems of bee-keeping possessing any merit, and having found in each defects prejudicial to the welfare of the bees, I have directed my attention towards establishing, if possible, a sound and advantageous system. All wooden hives or boxes are objectionable. They are too hot in summer and are too cold in winter; besides, they retain moisture which is injurious to the comb and health of the bees. I consider ventilation to be not only unnecessary but injurious; for the higher the temperature inside the hive is, the greater is the draught. Bees are very uncomfortable and irascible in windy weather, or if blown upon. At all times they may be seen anxiously stopping up every hole which they can find, particularly those, if any, in the upper part of the hives. This, therefore, speaks against ventilation. The natural heat of the hive is conducive to the health and activity of the bees, no instance to the contrary being known. It is only when the warmth of the external air somewhat assimilates to that of the hive, that they come out cheerfully. I have known a very high degree of summer heat drive bees apparently from their hives, and upon examination the honey and wax was more or less liquefied on account of the hive being exposed to the direct rays of the sun. This is a very serious evil, but one which is remedied by colonies of my construction. The following objects carried out are essential to the profitable keeping of bees: viz. large well-made straw hives to contain strong stocks, having no other opening than that at the bottom, and having no metal in any part of them, that being a conductor of heat. The best possible protection against mice and every kind of insect. Easy access by the bees to the glasses, &c., for working in, and facility for removing the latter: the whole to be impervious to the weather, heat, cold and wet. For effecting these ends, I would recommend a straw case, worked with split cane, 3 feet 9 inches in length, 16 inches in hight, and 14 in width, inside measurement. At 3 inches from the bottom, a floor of ½ inch deal should be fixed on supports at each end, and two bridge-shaped pieces should be placed at 14 inches from the ends. This case should stand on a wooden bottom 2 inches in thickness, 18 inches in width, and 50 in length, a little cement or mortar being put all round. For the purpose of preserving the case, I sew canvass on the outside, and size and paint it green, every spring giving it a fresh coat. A circular hole should be made in the middle of the floor 10 inches in diameter; on this should be placed early in April a large last year's swarm in a new bell-shaped hive. Two or three convenient holes, 3 inches in diameter, must also be made in the floor on each side of the stock-hive, and fitted with thick bungs. A door-way should be cut in the bottom at 12 inches from each end, 2 inches in width, and ⅔ths of an inch in depth: and a small appropriate piece of something should be nailed under each doorway for resting boards on. The doorways should be nearly closed in August with slips of wood, and opened again in April. The stand should have four legs, and each leg should rest in an iron or flower-dish containing water, with a little oil on the top of the water: over the top I tie canvass to keep out moths, spiders, &c.; a neat span-shaped painted wooden roof should cover the whole well over. In the first summer the bees will probably only fill the space under the floor, but if they appear, by collecting about the entrances, to want room, a small glass may be placed over one of the holes, first removing a bung by turning it round. Early in April is the proper time to commence putting on glasses, and when they are quite filled with honey, fresh glasses should be put on, and in a day or two the full ones may be removed by drawing a fine wire under them, and replacing the bungs. These hives will last for many years, and will yield in good summers one cwt. of honey, with but little trouble. Every three or four years the inside stocks should be examined by fumigating with fungus, and any old comb used for breeding should be removed. When additional stocks are required the glasses should not be put on until the bees have swarmed; at night the young swarm may be put into a straw case. I do not find that the queen quits this hive to breed in the glasses, nor do I ever find bee-bread in them. Early in November I close the doorways with mortar, leaving a quill as a passage for air; and it is advisable, at the same time, to bang a piece of sacking in front, until early in February, in order to prevent any warmth from the sun from affecting the stock. By bee-keepers pursuing this system, they will establish really valuable colonies. The cask-hives made by Mr. Sholl, are defective, and must cause disappointment at the royal Apiary at Windsor, where some have been placed. The awkward metal entrance, when the bees can alight upon it, will in summer burn them, and in winter cramp them; and the bottomless cases, when filled, cannot be removed on account of their being fixed down with comb.

[G. L. Smartt, Enfield.

SULPHURIC ACID AND BONES.—With reference to Mr. Pusey's suggestion as to the propriety of using bone-dust dissolved in sulphuric acid along with compost, instead of water, for turnips, I can confirm his idea from practice—having last year manured 5 acres with only 13 bushels of bone-dust dissolved in 270 lbs. of sulphuric acid and 150 gallons of water. After standing 24 hours, the liquid was mixed with 3 cart-loads of coal-ashes, and left to remain for a week, during which time it was turned over two or three times. The mixture was then drilled along with the seed, and the result was a fair crop of common turnips, off a piece of poor land, without other manure, and at the cost of only 12s. 9*d.* per acre.

[P. Davis—Roy. Eng. Ag. Soc. Jour.

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*The best way to enable an Editor to judge of the value of a work is to send him a copy. [*Ed. Lib.*

THE FAIR OF THE AMERICAN INSTITUTE.

THIS great Annual Exhibition of choice specimens of American art and industry, in many of their important branches, was favored with fine weather, and attracted, as usual, a great concourse of people, who have, we apprehend, been more dazzled and agreeably amused with the beauty and variety of the show, than struck with any visible and important step in the march of improvement. Some have suggested that the recurrence of these shows is too frequent to admit of any very perceptible progress in the melioration of the arts and sciences and trades they are designed to illustrate; still, they serve to keep the public advised of what can and has been done; and to keep cultivators, artisans and manufacturers, up to their mettle. The place of exhibition, however, is altogether inadequate to a thorough and convenient *national* display of that extensive and multifarious character, in a manner to do justice to the fabricators, or to enable the public to see and examine everything, as they ought with deliberation and convenience.

The City authorities would well consult the welfare of their constituents by purchasing extensive grounds, and constructing an edifice, worthy of the occasion, sufficiently capacious, and expressly arranged for a full and distinct exhibition of every article; and an adequate number of qualified persons should be employed, and well paid, beside the presiding and executive officers, to arrange and superintend the whole exhibition in all its departments, and a clear and precise official programme of each day's operations should be advertised in advance, and paid for, in every daily journal in the city. It is doubtful whether it would not be better to have them like the Mechanics' Institute in Boston, to come round once in *three years*, instead of annually. There would then be time for improvement in the various arts and mechanical inventions, and agricultural implements, and animals, and productions, to show itself distinctly; and committees of the ablest artisans, practical men, and men of science should be selected with great caution; men of the highest character, known throughout the Republic for their skill and proficiency, whose traveling expenses should be paid and who would undertake, *con amore*, to note and report upon whatever was *new* and *important*, as connected with the several great branches of American industry—and where no advance had been made in any, let that fact in like manner be noted. It would be an obvious part of the duties of such committees, to designate what is *yet wanting* in the economy of every pursuit, and for these *desiderata*, to recommend suitable prizes to be offered; and more especially should liberal premiums be proposed for ESSAYS and REPORTS on subjects connected with the progress and the wants of Agriculture and other pursuits, such as demand and can only be illustrated by careful experiment or profound scientific investigation. Investigations from which no profitable result is to be anticipated unless conducted by men of deep research, whose time is their subsistence, and who in this country are generally expected to *work for nothing and find themselves!*

Some timid calculators may at first be disposed to object to these views, as impracticable, on the score of *expense!* But the few who are invested with the noble trust of legislating for a great and daily growing community like this, should endeavor to look beyond the day or the year, and to elevate their views to the hight of their undertaking. Let the City Councils consider that an addition, sufficient in itself to make a very considerable town, is annually made, not only to the numbers but to the capabilities of New-York, and let them frame their measures accordingly.

Men in power are too apt to circumscribe their views and action to the present state of things, forgetting that almost every day is sensibly extending the horizon, and augmenting the wants of a community, such as that of New-York, which, even in the last three years, has added more than fifty thousand to its numbers. In 1860, even before the boy, just entering his teens, will have finished his scholastic education, New-York will embrace within its precincts 750,000 people! What undertaking in the way of city improvements and public accommodations are beyond the requirement and capabilities of such a population? And, after all, what can be more beneficent or more remunerative than liberal expenditures for public markets, public exhibitions, and free public lectures on all the elegant and useful arts, and all industrial and scientific studies and pursuits? Ay, and for public amusements too? Are not such institutions and lectures provided and sustained by taxes levied on tangible property. And, again, do not these public and free exhibitions

and lectures on the sound principles of political justice, contribute and inure to the value of the very property taxed, far beyond the amount of these exactions? If, for example, after the long-sighted policy which has made Paris the queen city and great attraction of the world, New-York were, (in addition to the purchase of extensive grounds in the upper suburbs of the city, and the erection there of capacious building for these periodical exhibitions of art and industry,) to engage on liberal salaries, the ablest lecturers (the most profound men that high pay could command) on the fine arts—on medicine and law—on the natural sciences, and the science of Agriculture and mechanical philosophy, and make these lectures free for all who might choose to come and whet (for they could never satiate) their appetite for knowledge; such a course of proceeding, and such expenditure, would contribute more than any thing that has ever yet done to the ornament and glory—ay, and to the growth and prosperity of the City; nor is there a property holder within its precincts who would not have occasion to applaud such measures as contributing more than any individual investment to the value of his estate.

It is as much the duty of those entrusted with the municipal administration of a great city to watch over its renown, and to build up for it a character, as it is to guard against fires and robberies.

Instruction profound and gratuitous, and the periodical distribution by enlightened and impartial authority, of suitable honors and rewards for excellence in the Arts and Sciences and in Manufactures and the products of Agriculture and Horticulture, would draw within its wall men the most distinguished for learning, and men of redundant wealth from all quarters of the world, just as they are now attracted to expend millions in Paris, until it would come to be esteemed as the surest passport to success, that a man should have learned his profession or trade in New-York—to have won distinction and prizes in her Schools and Lyceums and exhibitions would be accounted and prove in fact a substantial honor.

Not only for the purpose of illustrating our own views, in this particular case, but to give what may convey hints worthy of regard to State and even County Agricultural Societies, we will take room here, once for all, to give a list of the prizes offered in 1845, and 1846, by the Highland and Agricultural Society of Scotland. We do not give them, in any idea, that precisely the same premiums should be offered here, by the State Agricultural Society, or by the American Institute. Our design is to impress upon the mind of the reader, and of all enlightened friends of Agriculture, who go for its improvement and elevation as an *intellectual pursuit*, how much more conducive to that end, must be the development of principles, and the information which such prizes must elicit, than a mere *spectacle*, or congregation of things fat or beautiful, without being new, in themselves, or the fruit of any new discovery in science or practice. Of how much more value would be a description of Professor Mapes's discoveries in the manufacture of a great staple of the country, or a dissertation from Doctor Gardner or Hallowell on the connection of Chemistry with Agriculture, or of Muse on Entomology, or Doctor G. B. Smith on the capacity and readiness of the country for the production of Silk, or Bogardus on Mechanics, or Underhill on the Grape and Wine-making, or French or Wilder on Horticulture, than the mere exhibition of sleek horses or fat swine, with the sight of which all are familiar, and which illustrate no new principle, nor new application of old ones—nor imply any extraordinary skill in their production.

In giving preference to measures which shall be calculated at once to stimulate and provide food for the *mind*, and thus lead to economical Improvements and useful Inventions, we do not propose by any means to undervalue the effect of *public exhibitions of the best results that have already been obtained* in Arts and Manufactures, or in practical culture. Too many days, and weeks, and years have we devoted to their encouragement—getting them up, we may venture to say, in some places where it had never been attempted, and was deemed impracticable. No! No! We shall make ourselves justly obnoxious to no such insinuation. We well know that these Annual Exhibitions of a few of the best yet attained of Grains, and Vegetables, and Fowls, and Animals, and Implements, and Manufactures, serve as models for instruction to young Farmers and Mechanics, and to spur their ambition to rival them; but the *great desideratum* is to have the *mind at work* to discover what new means can be brought into play, or how Labor and Materials at command can be more skillfully applied to obtain greater products from given resources. This is the direction, too, which it behooves us to give to the thoughts and the minds of the young American Farmers. Let them be stimulated to *think*—to think, for example, as the men must do who bear off the prizes for best Essays on the subjects here below enumerated. But first let us note the *order* in which these Premiums are classified by the Highland Agricultural Society of Scotland, unsurpassed perhaps in the world for practical intelligence. There, the *first* Class is ESSAYS AND REPORTS ON SUBJECTS CONNECTED WITH THE SCIENCE AND PRACTICE OF AGRICULTURE; II. AGRICULTURAL MACHINERY; III. IMPROVEMENT

of Waste Land; IV. Crops and Culture; ☞ V. Live Stock; VI. Products of Live Stock; VII. Cottages; VIII. Woods and Plantations.

Now let us note the different subjects designated by the Society, and coming under Chap. 1.

CLASS I.—Essays and Reports on Subjects connected with the Science and Practice of Agriculture:

1. Experiments on the Effects Attending the Immediate Application, and the Continued Results of Certain Special Manures,
2. Feeding of Stock,
3. Radical Excretion of Plants,
4. Analysis of Oats,
5. On Raising Improved Varieties of Agricultural Plants,
6. On the Cultivation of Red Clover,
7. Influence of Plants on Dairy Produce,
8. Reports on Irrigation,
9. Construction of Tanks,
10. Potato Blossoms,
11. Allotment System,
12. Kelp,
13. Disease in Potatoes,
14. On the Nutritive Properties of Turnips Raised with different Manures,
15. Tussac Grass,
16. Spade and Fork Husbandry,
17. On the Advantages of Dibbling in Sowing,
18. Electro-Culture,
19. Wool,
20. Analyses of the Ashes of Plants,
21. Experiments in Deep Ploughing,
22. Vegetable Productions of India, China, and America,
23. Reports on Improved Rural Economy Abroad.

CLASS II.—Agricultural Machinery.

1. On the Comparative Advantages of Different Descriptions of Machines for Threshing Grain,
2. Invention or Improvement of Implements of Husbandry.

When we come in our next number to publish the explanation put forth by the Society, (which for want of room we cannot now do) the reader can judge for himself as to the exercise of mind, the degree of intelligence, and the class of men required to be employed in, and to battle for these prizes, and the usefulness, permanent usefulness, of the information which these Prize Essays must contain. It is in part from these identical Essays and Reports that we shall continue to draw for the columns of *this* Journal, as far as they are applicable to our own country. The experienced and indefatigable Editor of the Cultivator aptly observes in a late number, that "We have as yet no class of professional writers in this State, or in this country, who have given sufficient attention to the theory or practice of Agriculture, to enable them to furnish such Essays as grace many of the pages of the Journals of the Royal and Highland Societies We can expect little more at present than the simple details and practical observations of men who have paid more attention to the labors of the husbandman, than to those of the student of Nature. From the attention now given to the subject, however, we may look for a gradual and a rapid improvement in our Agricultural Literature."

There is much of the force of truth in these remarks; but we apprehend there is more want of adequate and proper inducement to our writers to lend to Scientific Agriculture their time and labor, than there is of the writers themselves. Let prizes of twenty and fifty guineas, or plate of the same value be offered; and we shall see whether on any given question we would not have men fully equal to the demand. Look at the Essay, for example, by Ruffin on calcareous manures—or the one produced by Mr. Thomas, with which we so gladly enriched the first number of the Farmers' Library, and the Essay of Professor Dana, lately published in the London Agricultural Journals; the Essay of Judge Rost, of Louisiana, which we have published, and that on the Natural History and Uses of Cotton, by Mr. Seabrook, now in course of publication, not to speak of Professor Emmons' Scientific disquisitions, with which his Quarterly abounds! We solicit, beforehand, the reader's attention to what we shall add on this subject in the next number—in the meantime we unite our humble expression of thanks to the Officers of the Institute, for their indefatigable and impartial discharge of their onerous duties.

The mere "Catalogue" of the more than fifteen hundred articles exhibited, occupies, in pamphlet form, thirty pages.

Mr. Walker, of the Horticultural Institute from Boston, well known for his taste and enterprise, made rich contributions to that Department, and by his obliging personal supervision, ensured the display of them to the best advantage, under the judicious and tasteful arrangements, and courteous management of Mr. Bridgman.

Peat Manure.—"A. Z.'s" inquiry about peat as a manure, is best answered by stating that peat contains the elements necessary for the formation of a rich manure, when proper substances, such as lime, marl, &c., are added to it, to decompose the tannic acid, and hasten the decay of the vegetable matter. Alone, and unprepared, peat appears to have no fertilizing property; but when properly dried and burned, the ashes have been found a good manure for grass lands and turnips; for turnips they are found to answer best in wet seasons. Quicklime will decompose vegetable substances, including peat: and the following will be found good proportions for making an excellent top-dressing for clover or grass:—One cart-load of quicklime, the largest lumps to be not larger than the fist, six cart-loads of peat, and a quarter of a ton of salt; the whole to be mixed together, and to lie in a heap six or seven months, and to be turned over two or three times during that period. Another capital method of converting peat into a manure, is by mixing it with fresh horse-dung, and checking the escape of the ammonia during the process of fermentation, by decomposing the carbonate of ammonia, and converting the ammonia into a sulphate by means of sulphuric acid.—Prepare your heap thus:—Four loads of peat, to be mixed in layers with two loads of fresh horse-dung, and, if great heat is evolved during the decomposition of the two bodies, cover up the heap with fresh mould, amongst which has been mixed a portion of sulphuric acid.

[English paper.

PROSPECTS FOR GRAIN GROWERS.—In our view of the news from Europe, there must be a greatly increased demand, and one that will continue, for our bread-stuffs and provisions. The fact is, that with long continued peace, the population of England and the continent is increasing beyond their means of supply. It would be well worth the while of Indian corn growers to have a Convention and to adopt such practicable measures as we are fully persuaded might be adopted to get Indian corn introduced into common use by the laboring, and even the higher classes in England. One-tenth of the money expended to make experiments in the cotton culture in England by American agents, would effect it. In the Mark-Lane Express of the 22d Sept. we find the following:

Is there sufficient food in the United Kingdom for the inhabitants up to the time of the next harvest?

The harvest of wheat of 1844 may be considered the finest in quality and quantity ever known, proved to be so from the great supplies into the markets all over England, and also for the continuance of them. The harvest of this year, 1845, is, in the opinion of the writer, different in its nature and kind, the bulk of straw is much greater, and the crop of wheat may be considered about two-thirds of the quantity in bread, the yield being much less per acre, and the berry not so fine or productive; this quantity, with the remaining surplus of old wheat, would have been likely to have carried us on comfortably till another harvest, with a little assistance of foreign aid, and with a good crop of potatoes; but the question now is, our real situation, and what is best to be done? The writer cannot place the general failure of potatoes at less than a loss to the country of three months' consumption of wheat; and when we consider that the quantity of wheat and flour under lock is only equal to about two weeks' consumption for England, we are likely before another harvest, to be in great want of food; adding to our calculations the state of the whole continent of Europe; in no one State is the crop of wheat great; in others, starvation has already reached them. In Belgium, the government has secured to their nation plenty, by taking off all but nominal duties on all descriptions of grain. This will be their happy state as long as their government is disposed to avail themselves of it, if other nations do not adopt the same plan by way of safeguard: but what with the forecast of Belgium, and the high price of wheat in Holland, which country is already getting away from England our little foreign supply; and if the British government do not follow the example of Belgium, great distress and misery will, or may, follow before the harvest of 1846; but if the government should at once, to secure the English merchant, by rescinding the grain duties till the next harvest, it is likely, they will bring, before that time, from far and near, a few millions of quarters in wheat and flour, thereby securing national plenty, at fair prices.

It is said, *Necessity has no law*; this is one plea for rescinding the grain duties for the short space of less than a year, and the example of Belgium is another. One farther remark seems to be called for. The present moderate price of wheat and potatoes is occasioned by there being a good stock of old wheat not consumed, and potatoes being sold at any price they will fetch, because they will not keep. Pig meat is likely to continue reasonable from the same cause, as the best of the offal potatoes are given to them. Query—will there be in the spring, potatoes for human food, for pigs, or for seed? The answer is, at a very high price for seed.

ELECTRO-CULTURE.

THE results of experiments in ELECTRO-CULTURE are by this time generally ascertained: our own and all others of which we have heard show that no influence is exerted on the growth of plants by an electro-conducting connection between elevated and buried wires, arranged either as Dr. FORSTER has recommended, or according to other plans which have been tried. The word *electro-culture*, in fact, must, for the present, be considered a misnomer.

There has been no want of electric disturbance this season in the atmosphere—hail and thunder-storms have been more than usually frequent—and we are, therefore, bound to believe that the experiments which have been tried are conclusive upon the subject. Their results leave every body at liberty, just as before, to form their own opinions as to the influence of atmospheric electricity on the growth of plants—they only determine our ignorance of any means by which this influence can be increased or controlled.

We understand that many hundred acres, in various parts of the kingdom, have this year been subjected to Dr. FORSTER's process. Has all this labor been lost?—that depends on the object of those who undertook it. Doubtless, some, believing in the evidence which previously existed on the subject, have speculated in electro-culture as a means of profit—*their* labor certainly has been useless, and they must now blame either their own carelessness in not having previously sufficiently examined that evidence, or their own credulity in reference to what we must consider the imperfect observations of others. But, wherever the subject has been tested by any one anxious merely to determine for himself the accuracy of Dr. FORSTER's theory, the expense and labor which have been incurred cannot be considered lost, for the object of their outlay has been attained. An intelligently-planned and carefully executed experiment, if its results be ascertained and recorded, cannot fail: it is simply a question asked of Nature, and what the experimenter wants is—an answer: and thus the success of an experiment depends not upon the *character*, but upon the *obviousness* of its results. Now, the results of the experiments we allude to have been most unequivocal, and accordingly those who performed them ought to be perfectly satisfied.

The history of the excitement which has prevailed on this subject during the past year is very instructive: it strikingly exhibits the willingness of farmers to adopt the suggestions of scientific men—a willingness which greatly increases the responsibility of those who set themselves up as guides to agricultural improvement.

[Agricultural Gazette.

An English paper in answer to a correspondent, says—"Early autumn is one of the best seasons of the year for sowing Italian rye-grass, of which from two to three bushels per acre can be sown on land properly prepared and clean."

NOTE ON BROAD-TAIL SHEEP.

BY THE EDITOR

THE following observations would more properly have been placed in juxtaposition with the chapter on the Tunisian Mountain Broad-tail Sheep, but the arrangements of the Printer, and the convenience of Editors, do not always jump together.

If the sheep confided to Judge Peters succeeded in continuing their race, it is more than was accomplished, either by those which were sent to Mr. Jefferson, or the more than one pair which were placed in our hands by Commodore Bainbridge, and otherwise. Mr. Jefferson said, that at Monticello, whenever the cross on the common Sheep was bred up to $\frac{7}{8}$ blood, the tail became so enlarged that farther procreation was physically forbidden. The same thing happened with those which came under our own observation, and we believe, also with some that helped to variegate the races of fine stock kept at Powelton, the property and then the residence of Col. Powel. No instance of procreation as between the full-blood, has occurred, but the contrary, within our observation, and hence, probably, the breed has run out; though it has not been many years since we remember to have seen a goodly number of apparently half-breed Lambs. Col. Powel once did us the kindness *(E Pluribus Unum)* to go through the Philadelphia market, where we interrogated the victualers as to the quality and popularity of the Lambs and Mutton in that market, of the mixed breed; and their testimony was unanimous in favor of the early maturity of the Lambs, and the excellence, in all respects, of the Lambs and Mutton which was supplied to that market from a touch of the broad-tail. They had never, said the victualers, had as early or as good Lamb since. And we understood that to this day, in New-Jersey, those who raise only Lamb for market, seek to get as deep into this race as they can.

In the 2d vol. of the memoir of the Pennsylvania Agricultural Society, pages 254–5, will be found certificates of eminent victualers, such as Lentz, Rusk and Groff, all concurring to the effect that they fatted in the flesh and on the ribs, far superior to most others. That they fatted with less food, and were more healthy than other breeds. "The Lambs sell the highest of any in the market, and are most sought after." "*We never met," say Messrs. Lentz and Rusk, "with an unsound Sheep of this breed.* We have kept an exact account of weights. We killed a ram of one year old, better than half blood, that weighed 23 pounds a quarter, well furnished with rough fat. An ewe three-quarter blood, two shears, 20 pounds a quarter, killed 10th June—20 pounds of gut fat in the ewe. The wool of the full blood or high blood, or when crossed with good fleeced Sheep, is in great estimation, and yields more to the fleece, the flock through, than any other breed we have been acquainted with."

Under all circumstances we are satisfied that the blood of this race of Sheep might be employed with satisfaction and profit; more especially by those who breed early Lambs for market. But whether they are now to be had, or whether it would be profitable and expedient to import them—in any case we deem it to have been our duty to preserve the most remarkable history extant, of their importation to the United States, in connection, especially, with the memoir of the agricultural services of the one patriot farmer, to whom they were confided by another, and both of whom were Presidents of Agricultural Societies, and eminently active in encouraging all efforts to improve the husbandry of their country.

We remember to have last year seen some Sheep of this race, just then imported. on the Presidential grounds at Washington, and understood they had been sent or brought in as presents to ex-President TYLER, in whose hands they will doubtless be well cared for, on the beautiful shores of the James River. In the hands of that eminent promoter of "*Annexation,*" it is not to be doubted they will multiply and flourish. For attention, care, and kind offices, *quadru*peds rarely prove ungrateful. Whether *bi*peds do, those in power have the best opportunity to judge—*when in retirement!*

WEIGHT OF CATTLE.—A correspondent of the Doncaster Chronicle, [England] gives the following admeasurement of six heifers, as to the increase in hight and girth, during a run of grass from May-day to Michaelmas day.

No.	Age.		May 13.		Oct. 14.	
			Hight.	Girth.	Hight.	Girth.
	yrs.	mo.	in.	in.	in.	in.
1	2	4	52	71	53	77
2	2	2	49½	70	50½	76
3	2	0	53	72	53¼	76
4	1	10	54¼	75	57	79
5	1	7	50	71	53	77
6	1	5	48	67	49¼	72

No. 4 an ox

SHEEP AND CHESNUTS.

FROM all the periodicals that reach us, conducted by our colleagues and predecessors, we might select interesting matter enough to make up a most valuable miscellany, but as we suppose, and most sincerely hope that most, if not all, of them are taken by the patrons of the Farmers' Library, we think it better to give matter which otherwise they would not be likely to see.

We take the following from the 'Cultivator' because the first will be useful as a practical guide to those, of whom there are many in the South, inquiring for Sheep; and the second compresses very useful information in a small compass, about planting *Chesnuts*—a thing most improvidently neglected—and which needs to be particularly illustrated.

There is no planter, who, if he should live to be sixty years of age, might not provide an ample supply of Locust and Chesnut timber *if he would*. By-the-by, Mr. MANICE, at his most beautiful residence on Long-Island, has the Spanish Chesnut in great number, of which he offered as many as we chose to take. They are now all gone.

LIVE STOCK IN CONNECTICUT.—*Sheep.*—Connecticut has many fine-wooled flocks of sheep, some of which we had the pleasure of examining in our late excursion through the State.

John Ward, of Salisbury, near Falls Village, has a flock of 700 Saxons. Their fleeces average 2½ pounds, and sold last year at 60 cts. per pound. In another part of Salisbury, we saw a small flock of Cotswolds, belonging to John C. Coffing, Esq. They were purchased of Mr. Devine, of Washington Hollow, Dutchess county, New-York.

R. G. Camp, Esq., of Litchfield, Ct., has a very superior flock of 170 Saxons. They were derived mostly from the noted flock of Charles B. Smith, Esq. of Torringford, Ct. The wool of Mr. Camp's sheep is very fine, and the fleeces averaged this season, 2 lbs. 14 ounces, which sold at 66⅔ cts. per pound. Mr. Smith imported two bucks from Saxony, in 1843. Both of these bucks Mr. Camp has used in his flocks. His lambs of the present season, many of them, are certainly very fine.

Mr. Lucas, of Goshen, N. Y., has a small flock of mixed Saxon and Merinoes, which are remarkable for the weight of their fleeces. Twelve ewes, six old ones and six yearlings, eight of which reared lambs, gave this season 61½ lbs. of well-washed wool—being an average of 5 pounds and 2 ounces.

Henry Watson, Esq., of East Windsor, has one of the best and most profitable flocks we have met with. He is a veteran in the breeding of Sheep, as well as other stock. He, in connection with Mr. Hurlbut, of Winchester, purchased some of the best Saxons of the first importation of Messrs. Searle, of Boston, in 1824. His present flock are of various grades of the Saxon blood then obtained, crossed with the pure Merino. His wool is fine, and he obtains the highest prices for it. At several manufacturing establishments where we happened to call, we saw or heard Mr. Watson's wool given as an example to wool-growers of what was wanted in quality and condition, *for fine wool*. This year it brought 50 cents per pound, sold in his neighborhood. Last year he sold it in the dirt, obtaining a price equal to 60 cents per pound for washed wool. His fleeces average over three pounds, washed. Bucks' fleeces weigh from 5 to 6½ pounds.

PLANTING CHESNUTS.—The rapid growth of the Chesnut, the excellence of its timber, and its fine ornamental appearance, render it a desirable object of cultivation. The fruit which it produces too is not the least consideration.

Many, however, who attempt raising the trees, partially or wholly fail in causing the seeds to germinate. This is usually owing to the seeds becoming *dry* before they are planted. A few days' exposure to dry air is sufficient to prevent their growing. Hence, as soon as they are taken from the tree they should be at once planted before drying a day, or mixed with moist sand, and kept in that condition till planted. They should not be covered more than inch and a half deep, if the soil is heavy, nor more than two inches if it is light; but a still better way is to plant them half that depth, and then spread on a thin covering—say one inch of peat, or rotten leaves, which will keep the surface soft and moist.

It must be remembered that mice are exceedingly found of the nuts, and if planted near grass lands, or other places frequented by mice, the young plants will be missing the next season.

MUCH SAID IN A SMALL COMPASS.

IF men of influence in society, and of power in government, would read and ponder what follows, it might go far toward bringing about a more practical system of instruction in our common schools, and of ultimately improving the face, as well as the morals of the country. Unfortunately, the men to whom the *great business of legislation* is confided, are too often men without qualification, or ambition to learn any thing beyond the readiest means of achieving a —*party triumph!*

ONE IMPORTANT CAUSE OF NON-IMPROVEMENT IN AGRICULTURE.—I had occasion to visit the son of a friend of mine, at a school of great respectability in a wealthy agricultural district. The master, a very intelligent person, showed me the details of his well-arranged establishment, which was certainly a pattern in every respect. On entering the well-filled schoolroom, he observed, that most of his scholars were farmers' sons. Glancing at his library, I inquired what books on agricultural subjects it contained? The master seemed struck with surprise (as if the thought of such books had never occurred to him,) and replied, "With shame I acknowledge, *not one*; but send me a list of such as you recommend, and I will immediately procure them." Now, I apprehend this case might be multiplied by a thousand or more. Can we wonder then that a youth who never heard the word agriculture at school, and who is seldom or never sent into different districts to be taught agriculture as a science, should go home to his parent, and follow his plan of farming—be it good, bad, or indifferent. In all other trades and professions an apprenticeship is con-

sidered essential to the acquirement of knowledge; but farming, the most necessary of all trades, is to be left to chance, or rather mischance. A system of uniformity is essential in making a hat, coat, or shoes—there are established educational rules for the church, the bar, and the senate; but agriculture, the greatest interest of all, on which our very existence depends, economically and politically, is to be like a ship without a compass, tossed about by the ever-varying gale of individual opinion, without a hope of reaching the port of Perfection. Were a youth ever so much inclined to furnish his mind with comparisons and observations of the various systems of culture in our own different counties, as well as in foreign climes, there is, under the present school system, no opportunity for his doing so; and, no doubt, he would be surprised if told that we are a century at least behind the Chinese in agricultural practice. I hope we shall soon see every school, and in fact, every farmer's parlor, possessing a few sound practical works on agriculture. I presume no man will consider he knows everything in agriculture—if he does, it is unfortunate for him. Little as I am acquainted with the subject, I am daily convinced that it is full of interest, and of such extent, that a lifetime of study and practice would find us on the wrong side of perfection.

[I. J. Mechi's Letters on Ag. Imp.

SHED FEEDING OF SHEEP.—Having observed that sheep in wet weather on our downs always select the most beaten roads for their bed, it occurred to me that not only when under sheds should they lie on boards, according to your own experiment, but also that the courts to which they have daily access whilst their houses are being cleaned, should be covered, not with soft litter, but with hard chalk or sand, or other materials to form a solid bottom. My little yards attached to the sheds are floored with a sort of asphalt, made of chalk beaten small, covered with gas-tar and sand. In constructing sheds for my sheep, I have kept in view the strictest economy; and I venture to send these minute details, which I hope will serve to prove that the protection of sheep from the inclemency of the weather is within the reach of every tenant farmer. Each of these sheds contains about 50 sheep. They are erected on a very simple plan —a couple of fir poles, 12 feet long, are nailed together at the top; their extremities, at a distance of 15 feet, are driven into the ground; another couple, 10 feet distant, are united with this, and held firm by a ridge-pole nailed into and lying between the tops of the fir poles.—Side pieces are nailed parallel to the ridge-pole, and small hazel-wood is interlaced so as to support the thatch, which a laborer ties on with tar-twine. The thatch in front and behind reaches to about 3 feet from the ground; behind, a bank of turf is raised to meet the thatch; the front is guarded by a hurdle, movable at pleasure, to allow the sheep to go into the court, which is of the same size as the shed. It is important that both ends of the shed should be protected with bavins only, which will secure a free ventilation, yet keep out rain.

My sheds, about 50 feet long, (not charging the straw,) cost about 41s. each. These sheds are covered with 1-inch boards, separated (each strip from the other) by ¾-inch intervals. The cost of the timber and mode of preparing the floor were as follows:—White pine timber was used for its cheapness, being 1s. 3*d.* the cube foot, which would therefore give eleven 1-inch boards. On account of the particular width of the logs which I bought, the board was sawed into pieces 7 inches broad and 1 inch thick.—These, for economy, are hand-sawn into three parts, and are nailed upon joists at a distance of ¾-inch. By this plan nearly one third of timber is saved: so that each sheep, requiring 9 feet of space, lies actually on 6 feet of 1-inch board.—The cost of timber for joists, nails, and carpenters' work, raises the total expense of placing the sheep on boards to 1s. 4*d.* per head. Instead of sleepers, I used small blocks, 6 inches thick, to keep the rafters from direct contact with the manure. The boards are put together into frames about 10 feet by 4, so that they may be easily taken up by one man. Beneath the boards, the floor, excavated 8 or 9 inches, is puddled and made water-tight, and covered with 6 inches of saw-dust, burnt clay, or good dry mould. This receives and absorbs the manure which falls, or is swept below twice a-day. The boards, after sweeping, are watered with a solution of 3 lbs. of sulphate of iron, which instantaneously removes the odor not only of the ammonia, but of the more offensive sulphureted hydrogen. The boards should be laid perfectly flat, to prevent the sheep slipping about. The sheep are fed under the sheds, not in the courts. The results of this arrangement have been most successful, both in the health and well-doing of the sheep. It is true that I have lost four head, which seem to have died from apoplexy; but I lost the same number in the flock which were at large, and treated in the usual manner.—Though I have had more than 300 South Downs so shedded, some of them longer than 5 months, yet I have never seen any instance of lameness, even in the least degree.

[Rev. A. Huxtable—Roy. Eng. Ag. Soc. Jour.

ARRIVAL OF THE STOCK IMPORTED BY THE MASS. SOCIETY FOR THE PROMOTION OF AGRICULTURE.—During the last week, the ship Chaos arrived at this port, in 29 days from Liverpool, having on board the stock purchased for the State Agricultural Society, by Mr. Alexander Beckett, who was sent out to England and Scotland, to make a selection of the best animals that could be obtained of the North Devon and Ayrshire breeds.

They consist of four Ayrshire cows and one bull, and four North Devon cows and one bull, and a fine calf which was dropped by one of the North Devon Cows on the passage.

The following ample daily allowance was provided for each animal for fifty days, viz.: 10 lbs. of hay, 10 lbs. of oil cake, 1 quart of bran, 1 quart of crushed oats, and 10 gallons of water. The freight bill for the cattle, together with the expense of fitting up the stable, and for water casks, independent of the food, was 140 pounds sterling, or about $700. This, with the first cost of the cattle, and expenses of Mr. Beckett, will make the round sum of something like $3000—a very generous outlay by the Society for the improvement of the stock of our State.

The animals are very fine looking, and we believe, gave perfect satisfaction to the President and other officers of the Society, who were present on the wharf to witness their landing.

The North Devon cows were purchased of Lord Leicester, of Holkham, Norfolk county, England; the bull, from Mr. Bloomfield, Wan-

ham, in the same county, of whose stock Mr. Colman has stated that he had seen none superior.

The Ayrshires were also thorough-bred, perfect in their kind, and the cows had the appearance of being fine milkers. Two were purchased from the stock of Mr. Andrew MacGregor, Damhead, near Kilmarnock, Scotland; one from Mr. John Young, of Kilmaurs Maine, near the same place; and one from Mr. Hamilton Capprainstone, Draghorn; the bull from Hugh Kighlongmair, near Kilmaurs, Scotland.

We have seen many fine, high-bred animals, and have formed an opinion as to what points are desirable in dairy stock; and according to the views we entertain, we think the selection Mr. Beckett has made highly creditable to his judgment, and of which the Society may be justly proud. Surely, the object which the Society have in view, of improving our New England stock, is one highly commendable, and we have no doubt will be justly appreciated by the agricultural community. [N. E. Farmer.

Disease in Potatoes.—The attention of every body is so absorbed by the Potato-Murrain, that we should be wanting in our duty towards the public if we did not continue to advert to the melancholy subject. Not that we have much to add either by way of advice or consolation; for the topics connected with the disease have all been already touched upon, more or less amply, by ourselves or our correspondents; and every week's experience satisfies us that there is little, if anything, to modify in the opinions we have ourselves already expressed.

The mischief is, undoubtedly, extensive to a most alarming degree. If we estimate the amount of loss at five-sixths, we shall hardly exceed the fact. In many places the crop is hardly worth the digging; in others it is totally putrid; in many more, it seems to be spreading fast; and, as we mentioned last week, it has certainly broken out in Ireland. "All *my* Potatoes," says a correspondent near Dublin, "as well as those of the poor people here, are destroyed by the murrain. Two days ago, 12 acres were still safe; they are now gone." Germany, Holland and Belgium, are in the same state as England. A dysentery which has already appeared at Erfurt, is said, by the *Gazette de Cologne*, to be traceable to the use of bad Potatoes. The Belgian papers speak of cholera at Ghent, produced in the same way. Poland, according to the same journals, is so threatened by famine, that the Prussian authorities on the frontier have been obliged to take precautionary measures for keeping the starving population out of the Prussian territory; and, finally, the authorities of some districts in France and Germany, have either prohibited or threatened to prohibit the exportation of Potatoes, lest there should be no seed for another year.

Such is the state of the case. It is useless now to speculate on the first cause of this murrain. Our original opinion was, we believe, correct; at least, we have not at present seen anything to shake our confidence in it; and we find that, with the single exception of Professor Morren, the universal opinion among the Belgian cultivators is the same as ours, except when meteors, electricity, and other unknown forces, are appealed to. It is true that a minute fungus has made matters infinitely worse; but that is, we quite believe, a secondary cause. The consideration of this part of the question may, however, be very well deferred. What we have now to look to is an immediate remedy for the evil. [London Gardeners' Chronicle.

Weight of Corn per Acre.—Capt. Randall, of New-Bedford, has recently published in the N. E. Farmer an account of the weight of his corn sown broad-cast on a couple of acres and some rods. He says 35 tons of manure were spread upon each acre. Ten bushels of white, flat, Maryland corn were sown on two acres and 32 rods. The whole was well plowed and repeatedly harrowed, and a heavy roller was applied. Three separate rods of this corn were cut and weighed, and the average weight per rod was 388 lbs. This gives between 31 and 32 tons per acre, sown broad-cast, very highly manured and land well prepared.

We think 40 tons per acre may be grown by sowing in drills, but the labor would be more, though the seed would not cost one quarter as much. Capt. Randall says he fed out his corn from 2 acres and 30 rods to 20 cows, three other cattle, and five calves, and it kept them 7 weeks and 5 days, with what they could pick in a dry pasture. And he is satisfied that this corn was equal to 15 tons of the very best of English hay.

But we think Capt. R. puts a wrong estimate on this fodder from his corn field. Fifteen tons of hay would keep his stock through half the winter without any aid from the pasture ground, yet while all his stock could bite, bushes and all, his corn kept his stock but one third of the time that cattle are fed in winter.

Cattle will find something in the driest pasture and will partially fill themselves there, even though you feed out the richest products of the farm.

Again, the 2 acres and 32 rods of ground, with this high manuring, would have produced this season 160 bushels of shelled corn, beside all the stalks and husks. This corn dealt out in meal would make an allowance of 6¾ bushels to each of the 24 cattle for 7 weeks and 5 days—or 213 quarts of meal each. That is, about three quarts of meal per day for each animal besides the husks and stalks. Should we not think it costly feeding to give out so much in addition to what could be obtained in the pasture?

We wish to see more experiments made on feeding out green corn, and we therefore make these remarks on the experiment of Capt. Randall. [Mass. Ploughman.

Price of Guano in England.—The Mark-Lane Express of Sept. 22d, quotes African guano, about 1000 tons sold at £4 5s. to £7—[$21 25, *a* $35.]—Peruvian £9 10s.—$47 50; Nitrate of Soda 19s. *a* 19s. 6d. per hundred.

Guano. At the meeting of the Monmouth Farmers' Club, Sept. 3, 1845, it was resolved unanimously:—"That the best thanks of this club be given to the Editors of the *Gardeners' Chronicle and Agricultural Gazette*, for their exposure of the infamous practices of dealers in guano in adulterating it.

Some decided encouragement should be offered for the exposure of frauds in selling seeds and *fruit-trees* in this country. You will hear many complain of infamous impositions, and yet none will publicly stigmatize the miscreants

DEATH OF EARL SPENCER. THE GREAT ENGLISH FARMER.

It has been truly said that the plow is of no party, neither is it of any country. Its uses and its fruits are of such universal application and so beneficent, that all friends of Agriculture may cordially join in mourning the death of a patron so elevated in rank, yet so affable in his deportment—so liberal in the use of his ample means, and so influential by his personal example as was Earl Spencer, whose death is announced in the last English journals.

It seems but as yesterday that we received his autograph letter, from which an extract was taken in a note made to the memoir of Judge Peters. By the last incident that we could have expected or desired, we are now relieved from the considerations of delicacy which then restrained us from giving the name of the writer—"It being impossible (says he) that any Englishman can desire more earnestly than I do that the friendly relations between our two countries shall be permanent."

As the noblest oak towers in the forest, so stood the deceased, conspicuous among his brother Farmers. How slowly is the chasm filled which is left by the removal of such men—and must we even say of them—good and useful as they are in their day and generation—

"What though we wade in wealth or roll in fame;
"Earth's highest station ends in "Here he lies,"
"And "dust to dust" concludes her noblest song!

EUROPEAN AGRICULTURE AND RURAL ECONOMY FROM PERSONAL OBSERVATIONS. By HENRY COLMAN—To be completed in ten numbers of not less than 100 pages each number:—Terms, $5 for the whole.

Of this valuable work we have just received part IV. The contents relate principally to the great FAIRS and MARKETS for Cattle in and out of London—for Cattle and Grain; Vegetables and Fruits; Dead Meat Markets, and Market-gardens, with Chapters on Corn duties, and the mode of adjusting Labor.

Every one at all in the habit of reading English Agricultural papers, will have experienced a desire to have a nearer view of these great marts for the substantial business transactions, and here will be found a picture than all more graphic and minute than ever, or could be had in any way, except by personal inspection.—The Chapter on Market-gardening is concluded with an observation to which we invite the notice of the reader—the public mind in our own country is ardently taking the same direction, and the time is coming when men seeking employment as Farmers and Gardeners, will have to bring proof of having been in like manner *educated for the business*.

"The science of Gardening," says Mr. Colman, "is here a substantial science, and young men are as carefully educated in its various departments, as in any of the sacred Professions, and receive a patronage according to their skill and merit. Under such circumstances the Market Gardens near London are managod with a skill and enterprise worthy of all praise, and sure of reward much more substantial."

THE NATIONAL MAGAZINE AND INDUSTRIAL RECORD. Edited by REDWOOD FISHER. New-York.

This work, which was commenced in June last, completes the first volume of about 300 pages, with the November number. Mr. Fisher is well known to the friends of Domestic Industry as an able writer in the cause, and the numbers of his magazine which have appeared contain many important articles on manufactures and commerce from his own pen, as well as contributions from some of the ablest writers in the United States. One feature of the magazine must be particularly interesting to all who are engaged in manufactures; namely, to notice such places in this country as have been built up by the interests of Manufactures or Commerce. Sketches of New Bedford and Lowell, in Massachusetts; Paterson and Somerville, in New-Jersey; Chicago, Illinois; Cleveland, Ohio, &c. have already appeared in the pages of the work. The Mining of Iron, Copper and Coal in the United States have also been the subjects of several important articles. We wish success to this enterprise of Mr. Fisher, commensurate with his admitted talents and industry.

DUTCH CORN-LAW.—*The Hague*, Sept. 15.—The disease which has attacked the potatoes in a great part of the kingdom has attracted the attention of the government. It has induced an inquiry into the causes and the character of the disease, and the means of preventing a rise in the prices of articles of subsistence.

The *Staats Courant* publishes a royal ordinance, dated the 14th of September, stating the measures taken by the government for the importation of articles of food:

"We, William II., &c. &c., seeing Article 2 of the law of 19th June, 1845;

"Having taken into consideration the unfavorable prospect of the crop of potatoes, which are one of the principal articles of food for the most numerous class; and that the general interest, as well as that of the commerce and manufactures of the country, requires that we should prevent by all possible means a rise in the price of provisions;

"Having likewise taken into consideration that in this respect the government should take no other measures than such as may tend to encourage as much as possible the importation of provisions for the working classes;

"On the report of our Minister of Finance, on the 9th September, 1845,

"Having consulted with our Minister of the Interior, with advice of our Council of State,

"Have decreed and decree—

"Art. 1. From the 15th of September, the import duties on the following articles are :—

"Potatoes, five cents per 10 mudd.

"Barley, one cent per 100 lbs.

"Rice, one cent per 100 lbs.

"Beans, peas, and lentils, 10 cents per last.

"Groats and pearl barley, three florins per 100 lbs.

"Flour, five florins per 100 lbs.

"This scale is fixed on all parcels of these articles, which shall be declared on importation on and after the 15th of September.

"Art. 2. We shall propose to the States-General in the next session the necessary measures to give legal validity to the regulations of Article 1 of the present decree, and also to fix till the 1st of June, 1846, or later if it should be judged necessary, the import duty on rye and buckwheat, at the rate fixed for the present month of September, of 15 cents, per mudd,* and on wheat and rye, for the same period, at 25 and 10 cents, per mudd on the minimum of the duties fixed on these kinds of grain, by the law of the 29th December, 1834.

"Our Minister of Finance is charged with the execution of the present decree, which is to be inserted in the bulletin of the law, and copies sent to our Minister of the Interior, and to the Council of State.

(*Mudd is about four English bushels. This reduction in the duties is very considerable.—By the tariff now suspended they are on potatoes five cents per mudd; on barley and rice 30 cents per 100 lbs.; on beans 7½ florins per last; on groats, &c., 10 florins per 100 lbs.; on wheat, rye, and flour, 20 florins per 100 lbs., and on potato-flour 10 florins per 100 lbs.)

The *Staats Courant* has a very long article on the subject. It states that the produce in 1843 was 14,662,571 mudds, and in 1844, 13,552,030 mudds, and that from the returns already made, it seems probable that two-thirds, if not three-fourths of the crop are spoiled by the disease.

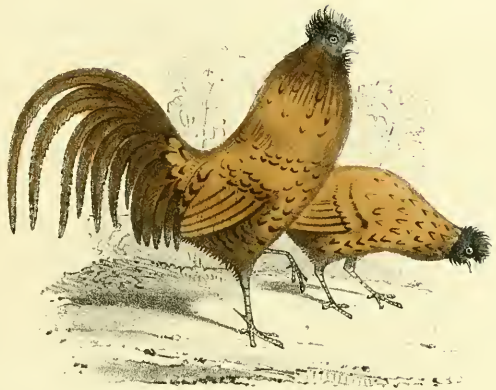
It is believed that the crops of rye, wheat, barley, buckwheat, beans, and peas will, on the whole, not fall short of those of last year.

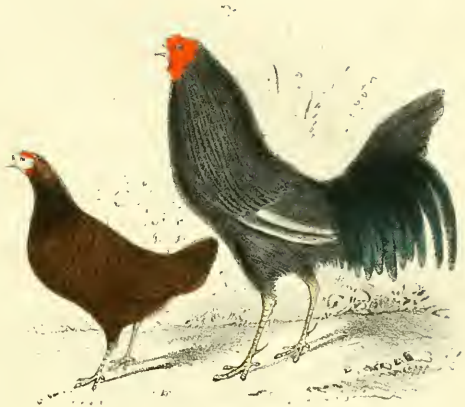
Removing Bees.—Where the queen-bee is put the rest of the bees will follow: set the hive where there is only a faint light; turn it up, and as the queen will make her appearance first, take and place her in an empty hive, and she will be followed by the rest of the bees.

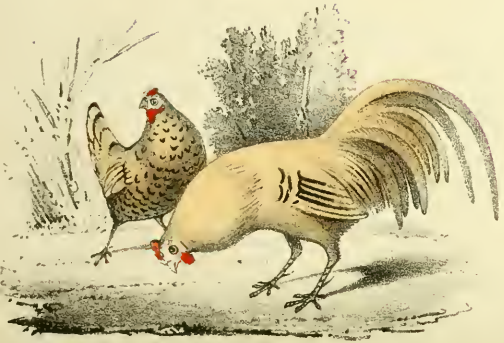
PRICES CURRENT.

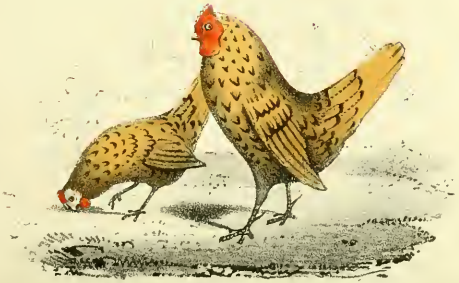
[*Corrected, October 22, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort	℔ 100 lb.	3	87½	@	3	93¾
Pearls, 1st sort, '45		4	12½	@	4	15
BEESWAX—American Yellow		—	—	@	—	30
CANDLES—Mould, Tallow	℔ lb.	—	9	@	—	11
Sperm, Eastern and City		—	27	@	—	28
COTTON—From		—	6⅝	@	—	9¾
COTTON BAGGING—American		—	12	@	—	13
CORDAGE—American	@ lb.	—	11	@	—	12
DOMESTIC GOODS—Shirtings	℔ y.	—	5	@	—	11
Sheetings		—	6½	@	—	15
FEATHERS—American, live		—	30	@	—	34
FLAX—American		—	7½	@	—	8
FLOUR & MEAL—Genesee	℔ bbl.	5	37½	@	5	43¾
Troy		5	37½	@	5	43¾
Michigan		5	37½	@	—	—
Ohio, flat hoop		5	37½	@	—	—
Ohio, Heywood & Venice		6	—	@	6	12½
Ohio, via New-Orleans		—	—	@	—	—
Pennsylvania		—	—	@	—	—
Brandywine		5	50	@	5	75
Georgetown		5	50	@	—	—
Baltimore City Mills		5	25	@	5	37½
Richmond City Mills		6	25	@	—	—
Richmond Country		5	25	@	5	37½
Alexandria, Petersburg, &c.		5	25	@	5	37½
Rye Flour		3	50	@	3	75
Corn Meal, Jersey and Brand		2	87½	@	3	12½
Corn Meal, Brandywine	hhd.	—	—	@	13	—
GRAIN—Wheat, Western	℔ bush.	1	—	@	1	10
Wheat, Southern	new	1	—	@	1	10
Rye, Northern		—	75	@	—	76
Corn, Jersey and North	(meas.)	—	68	@	—	70
Corn, Southern	(measure)	—	65	@	—	66
Corn, Southern	(weight)	—	66	@	—	68
Oats, Northern		—	42	@	—	43
Oats, Southern		—	35	@	—	37
HAY—North River	bales	—	70	@	—	80
HEMP—American, dew-rotted	ton	85	—	@	95	—
" " water-rotted		125	—	@	175	—
HOPS—1st sort, 1845		—	12½	@	—	15
IRON—American Pig, No. 1		32	50	@	40	—
" Common		27	50	@	32	50
LIME—Thomaston	℔ bbl,	1	05	@	1	06½
LUMBER—Boards, N.R.,	℔ M. ft. clr.	35	—	@	40	—
Boards, Eastern Pine		10	—	@	11	—
Boards, Albany Pine	℔ pce.	—	8	@	—	18
Plank, Georgia Pine	℔ M. ft.	33	—	@	40	—
Staves, White Oak, pipe		45	—	@	47	—
Staves, White Oak, hhd.		38	—	@	40	—
Staves, White Oak, bbl.		30	—	@	—	—
Staves, Red Oak, hhd.		30	—	@	32	—
Hoops		25	—	@	30	—
Scantling, Pine, Eastern		14	—	@	16	25
Scantling, Oak		30	—	@	35	—
Timber, Oak	℔ cubic foot	—	25	@	—	37
Timber, White Pine		—	18	@	—	25
Timber, Georgia Yellow Pine		—	30	@	—	35
Shingles, 18 in	℔ bunch	1	75	@	2	—
Shingles, Cedar, 3 feet, 1st quality		—	—	@	24	—
Shingles, Cedar, 3 feet, 2d quality		20	—	@	22	—
Shingles, Cedar, 2 feet, 1st quality		—	—	@	17	50
Shingles, Cedar, 2 feet, 2d quality		15	—	@	16	—
Shingles, Cypress, 2 feet		11	—	@	13	—
Shingles, Company		—	—	@	29	—
MUSTARD—American		—	16	@	—	31
NAILS—Wrought, 6d to 20d	℔ lb.	—	10	@	—	12½
Cut, 4d to 40d		—	4	@	—	4½
PLASTER PARIS—℔ ton		2	50	@	2	62½
PROVISIONS—Beef, Mess,	℔ bbl.	7	75	@	8	—
Beef, Prime,		4	75	@	5	—
Pork, Mess, Ohio, new		—	—	@	13	75
Pork, Prime, Ohio, old and new		10	12½	@	10	50
Lard, Ohio	℔ lb.	—	8	@	—	8¾
Hams, Pickled		—	7	@	—	7½
Shoulders, Pickled		—	5½	@	—	5¾
Sides, Pickled		—	—	@	—	—
Beef, Smoked	℔ lb.	—	8	@	—	8½
Butter, Orange County		—	20	@	—	22
Butter, Western Dairy		—	15	@	—	17
Butter, ordinary		—	12	@	—	14
Cheese, in casks and boxes		—	7	@	—	7½
SEEDS—Clover	℔ lb.	—	8½	@	—	9½
Timothy	℔ tierce	12	—	@	15	—
Flax, Rough		—	—	@	—	—
SOAP—N. York, Brown	℔ lb.	—	3½	@	—	5½
TALLOW—American, Rendered		—	7¾	@	—	7¾
TOBACCO—Virginia	@ lb.	—	3	@	—	6
North Carolina		—	3	@	—	5
Kentucky and Missouri		—	3	@	—	7
WOOL—Am. Saxony, Fleece,	℔ lb.	—	35	@	—	37½
American Full Blood Merino		—	32	@	—	34
American ½ and ¾ Merino		—	27	@	—	29
American Native and ¼ Merino		—	24	@	—	25
Superfine, Pulled		—	28	@	—	30

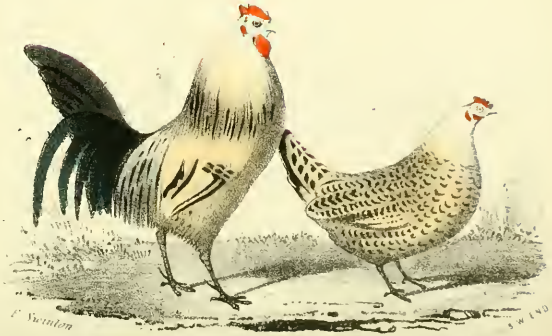








BANTAM OR PHEASANT FOWLS



BOLTON GREYS

MONTHLY

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THE HOUSEWIFE'S DEPARTMENT....POULTRY.

"TAKE weapon away, of what force is a man?
Take huswife from husband, and what is he than?

As lovers desireth together to dwell,
So husbandry loveth good huswifery well.

Though husbandry seemeth, to bring in the gains,
Yet huswifery labours, seem equal in pains.

Some respite to husbands the weather may send,
But huswives' affairs have never an end.

As true as thy faith,
Thus huswifery saith.

I serve for a day, for a week, for a year,
For life-time, for ever, while man dwelleth here.
For richer, for poorer, from north to the south.
For honest, for hardhead, for dainty of mouth.
For wed and unwedded, in sickness and health.
For all that well liveth, in good commonwealth.
For city, for country, for court, and for cart,
To quiet the head, and to comfort the heart."

TO ALL GOOD HOUSEWIVES, GREETING—*from the Editor of the Farmers' Library:*

IN the sixteenth century reigned in England that sanguinary villain, Henry VIII. who cared not so much about *chopping off a wife's head* as you would for the cutting off that of a favorite turkey. History says "he made himself so much feared that no English king had fewer checks to his power; and liberty and constitutional equipoise were out of the question during the whole of his reign—or, what is worse, *the forms of them were rendered purely subservient to his passions.*" If he ordered a law to be passed, it was done; and no sooner was it passed than by his will he could have it expunged. Well, it was in the latter part of the same century that gave birth to this licentious despot, that lived one "THOMAS TUSSER, GENTLEMAN," author of a poetical work on "FIVE HUNDRED POINTS OF GOOD HUSBANDRY, TOGETHER WITH A BOOK OF HUSWIFERY,"—to which last the above lines make the preface—and we beg you will let them do the same for what follows.

How vain would be all advice to the husbandman, and all his own care and industry—according to our observation, which has been "pretty considerable,"—if he be not seconded and encouraged by smiles and good management on the part of the housewife within her department.

"When husband is absent, let huswife be chief,
And look to their labour, that eateth her beef.
The huswife, so named (of keeping the house)
Must tend on her profit, as cat on a mouse."

Hence it is that we propose, but mind we don't yet absolutely promise, to open, and to fill as well as we can, a HOUSEWIFE'S DEPARTMENT, in at least every quarterly or third number of the Farmers' Library; for why, seeing that

"What husband provideth with money his drudge,
The huswife must look to, which way it doth trudge."

as Father Tusser says—why, say we, should she, too, not receive all the aid and enlightenment that can be given in her peculiar sphere of action? It was, therefore, good ladies, in the hope, rather than in the confidence of ability to

be useful, that in the last number we engaged to devote a few pages in this one to the consideration of some of the manifold cares and labors that belong to the domestic and social position of the housewife.

Everybody knows that all writers and men of good sense are agreed that, in all countries, nothing is a surer index of the state of civilization and social refinement than the more or less respect which is paid to females generally, and the estimate in which the public holds the part which is assigned to woman in the round of social life and duties. As information is diffused—as the arts flourish, and civilization advances—we see women everywhere withdrawn from field labor: their burdens are lightened; they cease to be hewers of wood and drawers of water; and respect, tenderness and kind treatment succeed to the hardships and contumely which are characteristic of savage life. This melioration of woman's lot is, in fact, the fairest fruit of glorious knowledge—the very consummation of humanity! For ourselves, we confess to an instinctive respect for a petticoat, even when hanging out to dry! but Heaven preserve us, at the same time, from carrying this march of refinement, in Republican America, to that degree of aristocratic Utopian sentimentality, under which domestic happiness and the honor and prosperity of the husband shall be unconnected with and independent of the cares and attention of the *wife and the mother!* No! no! Let it never come to pass that it shall cease in our land to be, as a general thing, one of the conditions of domestic felicity and success, that, according to our venerable and considerate author aforesaid—

"As huswives keep home, and be stirrers about,
So speedeth their winnings the whole year about."

How, in fact, in any natural and honorable state of things, should it be that the faithful discharge of her duties in either of these characters can be dispensed with! What, but for the mother, would be the lot of helpless infancy? At the very moment that experience begins to clear up the confusion of impressions derived through organs not yet perfectly developed, and the errors of one sense are rectified by the observations of another, education may be said to have already commenced, and, simultaneously, the sacred duties of the watchful mother!

"Children, like tender osiers, take the bow,
And, as they *first* are fashioned, so they grow.

With her very milk the child may be said to imbibe his sentiments and the elements of his character; hence the temper and principles even of the nurse are more important than is usually imagined. "In fact," says Plutarch, "if the Spartan does not cry even at the breast—if he be insensible to fear, and already patient under sufferings—he owes it to his nurse. On this homely point, let us recur again to our old counsellor, "THOMAS TUSSER, GENTLEMAN," of the age of black letter:

"Good huswives take pain, and do count it good luck,
To make their own breast their own child to give suck.
Though wrauling and rocking, be noisome so near,
Yet lost by ill nursing, is worser to hear.
But one thing I warn thee, let huswife be nurse,
Lest husband do find thee, too frank with his purse.
Teach child to ask blessing, serve God, and to church,
Then bless as a mother, else bless him with birch.
Thou huswife thus doing, what further shall need?
But all men to call thee good mother indeed."

But it was not within the scope of our promise or design to descant here on the higher and holier offices of the housewife in her capacity as a mother, in shaping and tempering the character of her offspring; else might we be at no loss for exemplifications, as well from ancient as from modern times, to prove how deeply the maternal influence has stamped itself on the lives of the most illustrious characters. We might speak of Penelope and Telemachus, among the Greeks—of Cornelia, the Roman Mother of the Gracchi; and, in more modern times, we might refer to Washington and Napoleon, among warriors and statesmen—to Henry IV.—to Francis I. of France—to Alfred the Great—to Pope, Gray, Cowper, Sir William Jones, Mr. Madison, and Henry Clay. But our purpose, at present, is rather to dwell on the more homely duties of the housewife, as conducive to domestic comfort, and indispensable to *successful husbandry.*

To treat of it in either one of its several branches, good books have been written, and yet better books might be, as for example, we have had books without number on Cookery, on Poultry, on Gardening; and lately, Mr. Loudon's book on Farming for Ladies. And why not? How often does it happen in our country, that wives are left in possession of large landed estates, with a house full of helpless children; and too often the estate encumbered with heavy debts, from which nothing but energy and good management can extricate it. What an awful responsibility for a feeble, uneducated woman, born to fortune, and reared in the lap of indulgence—educated to believe it unbecoming to learn anything but the arts and mysteries of the toilet! The common fate of women so reared and educated, is but too plain. In a few years nothing is left to them but abject ruin, or the dread of it prevails with her to throw herself under the conjugal wing of some loafer, of whom there are too many, watching for such prey, and by whom the wife is too often neglected, and children oppressed and defrauded. Then it is that knowledge, and the resolution and character which knowledge only can give, enables her to show the glorious attributes that belong to a cultivated woman, roused by neces-

sity to show *what a woman can do!* For such women we should go to the rice and cotton fields, if not to the agricultural annals of South Carolina, where many who might be named, have been known, with a fortitude and sagacity almost beyond their sex, to retrieve their dilapidated estates, and do infinite honor to themselves. We could name some in Virginia and Maryland; and if God spares our lives to follow out the design of this work in the spirit it was undertaken, the portrait and memoir of some such shall sooner or later, if to be had, adorn its pages.

But again, in a feeling of enthusiasm in all that concerns the sex in their highest aims, and claims upon our admiration and respect, we are wandering from the more homely but essential branches of domestic economy, on which it will be our pleasure to discourse with them from time to time; as for instance—on *rearing poultry;* on *preserving fruits;* on the *management of the kitchen, the dairy, the garden, the grapery; the flower bed;* on *knitting, needle-work,* &c. &c.

For the present our remarks and extracts must have reference to the *Plate of Poultry* which ornaments this number.

The Bolton Greys.—Of this breed Mr. Mowbray, from whose work our plate is taken, says,—"This variety, apparently the crack breed of their vicinity, but entirely unknown in the metropolis, is thus described by Rev. Mr. Ashworth:—'small size, short in the leg and plump in the make. The color of the genuine kind, invariably pure white in the whole lappet of the neck; the body white, thickly spotted with bright black bars at the extremity of the tail; they are chiefly esteemed as very constant layers, though their color would mark them for good table fowl.'" From this description it would seem that this breed might be worth importation; but after all, Mowbray's description of poultry-house-feeding, &c. are too aristocratic, refined, costly and impracticable for common use in this country. Such books are too often written by cockney book-makers, some of whom would hardly know a duck from a goose. Mr. Bement's book on Poultry is a valuable work, but being copy-righted, we do not take the liberty of extracting freely from it, but shall have recourse to Chambers' noble work, in which there is so little that is not worthy of a place, as entertaining matters of natural history, or of practical value, that we give very much at length what is there said, with notes, as they may be deemed to be appropriate and called for.

But the truth is, that these fancy breeds of pigeons and of poultry, as well as of domestic animals, do very well to please the eye, and to employ the speculations of the naturalist and bird fancier, but, for the most part, it is sufficient, if not better, to confine our attention to a *few sorts,* such as have been tried and proved, but if we have leisure and means, it were but a natural and innocent diversion to amuse ourselves with the several varieties in shape and color; and for ourselves, we would not be long on a farm, before we should become *personally* acquainted and familiar even to a feather, with each individual duck and goose and fowl and pigeon on the place—and that would be the only objection to the Guinea fowl—their undistinguishable sameness of shape, color, gait, walk, voice, temper, all as neat and uniform as West-Point graduates. By-the-bye, the most remarkable things exhibited at the late Agricultural Fair of the American Institute, were a pair of milk-white Guinea fowls, and a pair of milk-white mules. On inquiry, we had been anticipated in our wish to purchase the former, to send them to a friend in Carolina.

For American housewives there is more useful information in the article we shall take from the American Agriculturist, in this or the next number, by Mr. L. F. Allen, than in all Mowbray's book.

Speaking of varieties, there is a very large bodied, square-built breed to be found of late years only as far as we know in the neighborhood of Philadelphia, which we are under the impression is a different breed from the Bucks County; more compact and better clothed, and which we have heard called and purchased, under the name of the "*Ostrich* breed." The hens weigh five pounds from the roost when in good order, and the capon is said to weigh ten pounds. We think we have known one that weighed that much, to be sent to our old friend S. E. of Baltimore, who in matters of the table, knows a hawk from a handsaw, and never enjoys the best dish with so good a relish as when a friend partakes it with him. We purchased a few weeks since a pair of these to go to Carolina, the sire of which was said to have weighed 13 lbs.; and with them we sent, in the brig George, a pair of Malays of a rich changeable blue-black color, that promised to be of magnificent size and most splendid plumage. The egg of the Ostrich breed, as we once tested by the scales of the Chesapeake Bank, is exactly double that of an ordinary egg. The young chicken of the Bucks County breed, that we remember when a small chap, was longer on the leg and half naked.

POULTRY.

Poultry (from *poule,* French for hen) is a term applied to different kinds of large birds in a state of domestication, as the chicken or barn-door fowl, turkey, goose, pea-fowl, and guinea-fowl. The most numerous and important in every respect are those first mentioned.

Chickens.—The chicken is classed by the naturalists in the tribe of the *Gallinaceæ,* forming

part of the order *Rasores*, or Scraping-Birds. It is needless to describe minutely the appearance of the barn-door fowl. The most prominent characteristics of the cock, or male bird, are a thin indented comb, with wattles on each side under the beak; a tail rising in an arch, and a great variegation of colors. The female, or hen, is smaller as regards body, comb and wattles, and her tints are less vivid. The domestication of this bird seems to have taken place in the earliest times, and Persia is usually supposed to have been the place of its origin. Many varieties of it have been enumerated as existing in Britain; but the differences betwixt these, in the majority of cases, seem to lie as much in color as in any more important features. The best marked kinds are the following: The Dung-hill Fowl, Game Fowl, Dorking Fowl, Poland Fowl, Spanish Fowl, and Bantam.

The first of these varieties is a mongrel one, arising from crosses with all the other breeds; but it is the common and most useful variety. The best fowls of this sort are of middle-size and dark color, and have white, clean legs; the pure white dung-hill fowls are held to be the weakest in constitution, and to lay fewest eggs. It has been usually agreed to call the game fowl the proper English fowl. The body is erect and slender, and the colors showy, particularly those of the cock. In comparison with other breeds, the game bird is like the race horse beside that which draws the cart and plow. The flesh, moreover, is peculiarly white and delicate in flavor, while, though small, the eggs are also of a very superior quality. There is a peculiarity of disposition, however, in this variety of the domestic fowl, which, while for ages the source of a cruel species of sport, has always impaired the real utility of the creature to a very great degree. We allude to the pugnacious spirit which has gained for the fowl its peculiar name, So strongly marked is this propensity, that broods scarcely feathered are found occasionally to have reduced themselves to utter blindness by reciprocal battling. Even when the breed is crossed and re-crossed, a tincture of the love of fighting still remains, rendering such admixtures of species the source of risk and trouble, though in other respects very advantageous. Hence game-cocks are bred on a large scale almost solely for the battles of the cock-pit. Where persons prefer to have a game-cock in their poultry-yard, their choice, according to the best authorities, should be directed to birds of some one or other of the following colors: dark-red, dark black-breasted red, dark-grey, mealy-grey, and red dun. The Dorking fowl is named from a town in Surrey, where it has long been bred in great numbers. It is a large bird, well-shaped, with a long capacious body, short legs, and five claws upon each foot instead of four. These distinctive marks seem to be of old standing in peculiar breeds, as both Aristotle and Pliny mention five-toed fowls. Though, from repeated crossings, the Dorking fowls are now found of all colors, white or yellowish-white is supposed to have been the primitive and genuine tint. They lay large eggs, and in great plenty. The Poland (Polish or Paduan) fowl is much valued by breeders, but is seldom found perfectly pure in Britain. The species was imported principally from Holland, and when unmixed, was uniformly of a black color, with a white crest or tuft on the heads of both cock and hen. Their form is plump and deep, and the legs of the best sorts not too long. They are called *everlasting* layers, from the number of eggs produced by them, and from their disinclination to sit and hatch, which office is usually done for their eggs by other hens. The Spanish fowl is of large size, and lays large eggs. It is of the Polish family, and is almost uniformily marked by a black body, black legs, and large red combs. In London and its vicinity, the breed is now extremely common, being valued for the size of the eggs; but it is supposed to be inferior in some respects to other breeds, though yielding good food. The Bantam fowl is well known for its small size, and its feathered grotesque-looking limbs. It was originally a native of India and the nankeen-colored and black birds are the most esteemed. The bantam should have a rose-comb, a full tail, and a lively carriage, and should not weigh above one pound. It has been recently discovered that the characteristic of feathered legs is not an improvement, the birds with clean bright limbs being the best. The flesh of this breed of fowls is peculiarly delicate.

Besides these well-marked varieties of the common domestic fowl, there are a number of others, brought from foreign countries, which have produced mixtures pretty familiar to breeders. The Turkish, Malay, Rumkin, Russian, and Barbary species, may be mentioned as the principal of these. It need only be observed here, that all the crested mixtures or varieties of fowls are much esteemed, as possessing the best qualities of the race. All or any of these breeds of domestic fowls are valuable to the cottager, even one good laying hen being a treasure to a humble family.

Hen House.—Another simple poultry-house of small size may be formed by building a shed against the gable of the house, opposite to the part warmed by the kitchen fire, and placing cross-bars in it for roosting, with boxes for laying in, or quantities of fresh straw. There should always be an opening, to allow of the cleaning out, once a week at least, of the poultry-house—a process too often neglected, but very essential to the health of the Poultry. They never will thrive long amid uncleanness; and even with the utmost care, a place where Poultry have been long kept becomes what the housewives call tainted, and there they will thrive no longer. The surface of the ground becomes saturated with their exuviæ, and is therefore no longer healthy. To avoid this effect, some poulterers in the country frequently change the sites of their poultry-houses, to obtain fresh ground; and to guard against the same misfortune, farmers, who cannot change their hen-houses and yards, purify the houses by fumigations of blazing pitch, by washing with hot lime water, and by strewing large quantities of pure sand both within and without the poultry-houses. Washing the floor of the house every week is necessary; for which purpose it is of advantage that it be paved either with stones, bricks, or tiles. But as these three modes are expensive, a good flooring, which is cheaper, may be formed by using a composition composed of lime and smithy ashes, together with the riddlings of common kitchen ashes; these having been all finely broken, must be mixed together with water, and put on the floor with a mason's trowel, and nicely smoothed on the surface. If this is put on a floor which is in a tolerably dry situation, and allowed to harden before being used, it will become nearly as solid and compact as stone, and is almost as durable. The inside of the laying boxes requires frequent

washing with hot lime-water, to free them from vermin, which greatly torment the sitting hens. For the same purpose, Poultry should always have a heap of dry sand or fine ashes laid under some covered place, or thick tree, near their yard, for them to dust themselves in; this being their resource for getting rid of the vermin with which they are annoyed.

The office of keeping and managing domestic fowls should be performed by some individual whom the hens know, as the voice and presence of a stranger scare the fowls and disturb the operations of the hen-house. To distribute food and drink at regular hours, to visit the nests, to remove eggs as soon as laid, and carry them to a cool place, to examine by candle-light what eggs are fecundated, and to place these under the hen, and mark the time, are among the daily duties performed by the keeper. When the hens lay in a secret place, the keeper may readily discover it by placing a few grains of salt in the oviduct, which hurries on the process of laying, and causes the hen to retire to the spot anew.

Feeding.—Most persons are doubtless aware that fowls swallow food without mastication. That process is rendered unnecessary by the provision of a *crop*, an organ which is somewhat similar to the first stomach of the cow, and in which the food from the gullet is macerated, and partly dissolved by secreted fluids. From the crop, the food passes downwards into a second small cavity, where it is partly acted on by digestive juice; and finally, it is transferred to the gizzard, or last stomach, which is furnished with muscular and cartilaginous linings of very great strength. In the gizzard, the partially softened food is triturated, and converted into a thin paste, fit to be received into the chyle-gut, and finally absorbed into the circulation. Such is the power of the gizzard in almost all kinds of Poultry, that hollow globes of glass are reduced in it to fine powder in a few hours. The most rough and jagged bodies do no injury to the coats of the gizzard. Spallanzani even introduced a ball of lead, with twelve strong needles so fixed in it that their points projected a fourth of an inch from the surface, and the result was, that all the needles, with the exception of one or two, were ground down in a short time to the surface of the ball, while those left were reduced to mere stumps. It is remarkable that, to add to the triturating powers of the gizzard, fowls are gifted with the instinct of swallowing stones with their food.

Fowls, when left to roam at large, pick up all sorts of seeds, grains, worms, larvæ of insects, or any other edible substances they can discover either on the surface of the ground or by scraping. They also pick a little grass as a stomachic. The more that hens can be allowed to run about to pick up their own food, the better for their own health and the pockets of their keeper. When secluded and fed altogether in an artificial manner, their keep becomes expensive, and is, on the whole, seldom compensated by their produce. We have, indeed, great hesitation in advising any one to keep fowls who cannot unexpensively give them plenty of refuse from the table or kitchen, or permit them to range in the field or lane in quest of what seems proper for their natural appetite. The very pleasure of ranging and scraping seems advantageous to the animals.

If kept in a court-yard or pen, and requiring altogether artificial feeding, their natural tastes should be consulted as far as conveniently practicable. They should be fed regularly and with a miscellaneous kind of diet; allowed at all times access to clean water for drinking, and have earth, sand, or dust, to scrape at pleasure and roll themselves in. A certain quantity of chalk or lime should also be scattered about for them to pick up, as that material is required by them in the production of eggs. Speaking on this subject, Professor Gregory of Aberdeen, in a letter to a friend, published in a newspaper, observes, "As I suppose you keep Poultry, I may tell you that it has been ascertained that, if you mix with their food a sufficient quantity of egg-shells or chalk, which they eat greedily, they will lay, other things being equal, twice or thrice as many eggs as before. A well-fed fowl is disposed to lay a vast number of eggs, but cannot do so without the materials for the shells, however nourishing in other respects her food may be; indeed, a fowl fed on food and water free from carbonate of lime, and not finding any in the soil, or in the shape of mortar, which they often eat off the walls, would lay no eggs at all, with the best will in the world."

In a state of domestication, the hard food of which fowls seem most fond are peas and barley (oats they do not like); and besides a proportion of these, they may be given crumbs of bread, lumps of boiled potatoes, not too cold, or any other refuse. They are much pleased to pick a bone; the pickings warm them, and excite their laying propensities. If they can be supplied with caterpillars, worms, or maggots, the same end will be served. Any species of animal food, however, should be administered sparingly; and the staple articles of diet must always be of a vegetable nature. When wanted for killing, the quantity of food may be increased and be more substantial; they should always be kept more within the coop. A fortnight's feeding in this way will bring a fowl of a good breed up to a plump condition.

Laying.—The ordinary productiveness of the hen is truly astonishing, as it usually lays, in the course of a year, two hundred eggs, provided it be allowed to go at liberty, is well fed, and has a plentiful supply of water. Many instances have been known of hens laying three hundred in a year. This is a singular provision in nature, and it would appear to have been intended peculiarly for the use of man, as the hen usually incubates only once in a year, although she will occasionally bring out two broods. Few hens are capable of hatching more than from twelve to fifteen eggs; so that, allowing they were all to sit twice a year, and bring out fifteen at a time, there would still be at least one hundred and seventy spare eggs for the use of man. It is therefore evident, that in situations where hens can pick up their food, they must prove very profitable; for, supposing that the eggs of one fowl during the year were sold, without any of them being hatched, they would bring (if near a large city) on an average ninepence per dozen, or fourteen shillings, and the hen herself would be worth two shillings at least. As the number of eggs which are annually brought out by a hen bear no proportion to the number which she lays, schemes have been imagined to hatch all the eggs of a hen, and thus turn her produce to the greatest advantage; so that, in place of twelve or fourteen chickens, upwards of two hundred may be produced.

Hens will lay eggs which have received no impregnation, but from these, as a matter of

course, no hatching can take place; they are equally good, however, for eating. When the chief object is to breed chickens, a cock should be allowed to walk with ten or twelve hens; but when eggs are principally required, the number of hens may be from fifteen to twenty. Endeavor to procure a cock of a good breed, not game, and let him be in his prime, which is at eighteen months to two years old. Cocks will last two years, after which they lose their liveliness of colors, and become languid, inactive, and mere consumers of food. It is fit, therefore, that younger cocks should then take their place in the poultry-yard. It is common to make choice of a young cock by pitting one or two against each other, and selecting the most courageous, which is always the favorite of the yard.

Some remarks have been made on the colors of the best hens of the different varieties. As to other qualities, M. Parmentier recommends that they should be chosen of a middling size, robust constitution, large head, bright eyes, and pendant comb. Crowers should be rejected, and those that are of [the *Caudle* family with] quarrelsome tempers, such hens being rarely good hatchers or layers. Old hens, or those above four or five years old, are of little use when added to a stock; and when the comb and claws are rough, it is a sign that they have ceased to lay.

If left to themselves, hens would produce, like some wild birds, two broods in the year.—Early spring, and, after a cessation, the end of summer are the two seasons at which they begin naturally to lay. In the depth of winter, under ordinary circumstances, hens very rarely lay eggs, though by artificial means they can be made to do so. If the temperature of the place where they are kept be raised by a stove, or otherwise, they will produce eggs. The fowls of the Irish peasantry, which are usually kept in the cabins of the owners, lay often in winter, in consequence of the warmth of their quarters; and there can be no doubt that warmth affords the most effective means of procuring new-laid eggs in winter, though stimulating food may aid in producing the same result. The fecundity of hens varies considerably. Some lay but once in three days, others every second day, and others every day. In order to induce laying, each hen should have its own nest, made with soft straw, and furnished with a piece of chalk as a decoy. The signs which indicate when a hen is about to lay are well known. She cackles frequently, walks restlessly about, and shows a brighter redness in her comb and wattles.—After the process of laying is over, she utters a loud and peculiar note, to which the other fowls usually respond. Shortly after the egg is laid, it should be removed, for the heat of the hen soon corrupts it. When the eggs are taken away by the poultry-keeper, they should immediately be laid in a cool and dry place. If allowed to absorb damp, they soon spoil; indeed, one drop of water upon the shell quickly taints the whole egg.* Various methods have been tried to prevent the absorption of air through the shell, and preserve the freshness of the eggs. A not uncommon plan is to keep them secluded from the air in bran, rye, or ashes, which may do very well where the eggs are to be kept in this way till eaten, but is utterly useless if quantities of them have to be sent to market. We beg to offer a plain piece of advice to cottagers on this subject, which, if properly acted upon, will give them the means of at all times commanding the highest price for *fresh eggs*, although situated a hundred miles or more from the place of sale. *Smear all your eggs with a bit of fresh butter the moment you get hold of them.* Do not load the shell with grease, but merely give a light varnish. The butter must be good. By this simple process of smearing, which does not taint the interior in the slightest degree, the egg is as fresh at the breakfast table when three months old as if just newly laid.—Scarcely any thing is more common than to hear complaints of the difficulty of getting fresh eggs, and all a result of the sheer negligence of fowl-keepers. By the plan we mention, there need never be such a thing as a bad egg heard of.

Hatching.—When eggs are to be hatched, it is necessary to pay attention to the choice of proper ones for the purpose. The company of the male bird renders the hen productive of fecundated eggs, and, as already noticed, it is only eggs of this kind which are available for producing young. The eggs must also be fresh; from the time they are laid, they should lie aside in a cool place. It is said to be possible to ascertain, from the appearance of the egg, whether the forthcoming progeny is to be male or female; but we greatly doubt the truth of the popular notions on this subject. When eggs are left to be brought forth by the hen, a certain number is placed under her in the nest, when she is in the full inclination to sit. From nine to twelve eggs are placed, according to the extent of the breast and wings; and the time required for hatching is twenty-one days. Sometimes a hen will desert her eggs, a circumstance which may occasionally be traced to an uncomfortable condition of the skin, caused by vermin or want of cleanliness, and this affords a strong reason for keeping the hen-house clean, and giving the animals the means of purifying their feathers. Occasionally, the hen is vicious, or, in short, a bad sitter, and experience in pitching on the best hatching hens is the only remedy.—Sometimes a hen will break her eggs with her feet, and in all such cases, the broken eggs must be removed as soon as observed, otherwise the hen may eat them, and from that may be tempted to break and eat the sound ones, and spoil the whole batch.

It has generally been found, that hens which are the best layers are the worst sitters. Those best adapted have short legs, a broad body, large wings, well furnished with feathers, their nails and spurs not too long or sharp. The desire to sit is made known by a particular sort of clucking; and a feverish state ensues, in which the natural heat of the hen's body is very much increased. The inclination, or, as physiologists term it, the *storge*, soon becomes a strong and ungovernable passion. The hen flutters about, hangs her wings, bristles up her feathers, searches every where for eggs to sit upon; and if she finds any, whether laid by herself or others, she immediately seats herself upon them.

With a proper provision of food at hand, warmth, quiet, and dryness, a good hatching hen will give little trouble, and in due time the brood will come forth; one or two eggs may perhaps remain unhatched or addled, but their loss is of little consequence. As soon as the hen hears the chirp of her young, she has a tendency to walk off with them, leaving the unhatch-

* If this be so how does it happen that the eggs of turkeys, partridges and other birds exposed to rain, are not all destroyed? [*Ed. Farm. Lib.*

ed eggs to their fate; it is therefore advisable to watch the birth of the chicks, and to remove each as soon as it becomes dry, which may be in a few hours afterwards. By this means, the hen will sit to hatch the whole; yet she should not be wearied by too long sitting. If all the eggs are not hatched at the end of twelve or fifteen hours after the first chick makes its appearance, in all probability they are addled, and may be abandoned. The chicks must be kept in a warm place during the first day, and at night restored to the mother, who now assumes her maternal duties. The food given to the young chicks should be split grits,† which they require no teaching to pick up; afterwards the ordinary food of the poultry-yard, or what the mother discovers for their use, is sufficient.—Some give the yolks of hard-boiled eggs or curd, when a nourishing diet seems advisable. The extreme solicitude of the hen for her young, or the brood which may be imposed upon her, is well known. She leads them about in quest of food, defends them by violent gesticulations and the weapons which Nature has given her, calls them around her by a peculiar clucking cry, and gathers them carefully under her wings to shelter them from danger, or to keep them warm at night. This maternal care is bestowed as long as the chickens require her assistance; as soon as they can shift for themselves, the mutual attachment ceases, and all knowledge of each other is lost. The young now go to roost, and the mother again begins to lay. Young hens, usually called pullets, begin to lay the spring after they are hatched.

Diseases.—Chickens are liable to various diseases, demanding attention from the poultry-keeper. The *pip* is the most common; it consists of a catarrhal thickening of the membrane of the tongue, causing a dangerous and obvious obstruction to respiration. It may be cured in most cases by throwing the fowl on its back, holding open the beak, and scraping or peeling off the membrane with a needle or the nail. The part may be wetted with salt or vinegar afterwards, and a little fresh butter pushed over the throat. Dr. Bechstein recommends giving a mixture of butter, pepper, garlic, and horse-radish, as an internal remedy. But the operation is most effective. *Thirst* sometimes attacks fowls like a fever, and often arises simply from dry food, though more frequently symptomatic of indigestion, or some internal and deep-seated derangement. Careful attention to diet is the first and great point in all such cases. If *constipation* appear to be present, bread soaked in warm milk, boiled carrots or cabbages, earthworms, chopped suet, or hot potatoes with dripping, will be found useful. A clyster of sweet oil should be tried in severe cases. Where a tonic seems to be required a little iron rust may be mixed with the food, and will generally relieve atrophy or loss of flesh. Where diarrhœa or scouring is observed, iron or alum may be given in small quantities. There is also a species of influenza, called the *roup*, which is often epidemical in the poultry-yard, and causes much havoc among the young birds. The eyes become swollen, a discharge comes from the nostrils, and the fowl gapes continually, showing much difficulty of breathing. Some observers have ascribed this complaint to worms in the windpipe, and have recommended their extraction by an operation; but warmth, cleanliness, soft food, and such laxatives as sulphur, with frequent ablutions of the eyes and nostrils, are more likely, perhaps, to do good, and are not attended with danger. Where general fever has been observed in fowls, the use of a little nitre has been found very advantageous. Saffron is another remedy very often employed in relieving the symptoms of sickness in fowls.

Many of these remarks will apply equally well to the diseases of geese and the other species of domestic poultry yet to be noticed, and this subject, therefore, need not again be adverted to in detail.

Turkeys.—The turkey, like the common chicken, has been included by naturalists in the *Gallinaceous* family of birds, and possesses the main characteristics common to the whole. It is certainly one of the most valuable fowls which have been naturalized in this country, but is very difficult to rear. The turkey-hen lays from fifteen to twenty eggs, and then sits upon them. She will bring out two broods in a year. The eggs are of a pale yellowish-white color, finely streaked and spotted with reddish-yellow. They are a most delicious food, much more delicate in their flavor than those of the common hen. In England or Scotland, however, the eggs are seldom to be met with for sale, being deemed too valuable to be used as food. In Ireland they are to be got in the markets in great abundance, especially in the midland counties, where we have bought them at ninepence per dozen. In that country, when the turkey-hen has laid about half a dozen eggs, they afterwards take away one daily, by which means the hens are induced to produce a greater number of eggs than otherwise. This they assist by means of stimulating food, such as hemp-seed and buckwheat. There is an interval of a day between the laying of each egg. It is said that the first two eggs which she lays are unfruitful. A turkey-hen can seldom hatch more than from sixteen to eighteen eggs. The time of incubation varies from twenty-seven to twenty-eight days, at which time the young begin to pierce their shelly prison, and emerge from it. When they first come forth, they are extremely weak, and much assiduous care is necessary to rear them. The first thing to be attended to is, to remove them to a situation where they are not exposed to the sun's rays, which at first are too powerful for them. A woody place is the most suitable to their natural habits. Nothing is so destructive to them as rain, from which they must be protected.

When young turkeys accidentally get wet, they should be brought into a house, carefully dried by applying soft towels to them, and then placed near a fire, and fed upon bread which has been mixed with a small proportion of ground pepper or ginger. It should be made up in the form of small peas. If the bread is too dry for this purpose, it may be moistened with a little sweet milk. Should the turkey-poults refuse to eat it, a few of these pellets may be forced down their throats. Even heavy dews prove destructive to them, and frost is no less injurious in its effects. These must, therefore, be most carefully guarded against, when the hens incubate in March or early in April. Dry and sandy situations are most congenial for breeding turkeys, and especially elevated situations where large woods are contiguous. A single male turkey is sufficient for twelve or sixteen females, although the for-

† Indian corn and corn meal are the great substitutes in our country, for other grains used in Europe, as well for poultry as for animals. [*Ed. Farm. Lib.*

mer number is probably the safest, to prevent sterility in the eggs, which is frequently the case with those of turkeys. Eggs should never be entrusted to the care of a female until she is at least two years of age, and they may be kept for the purpose of incubation till they reach their tenth year. The largest and strongest hens should always be kept for this purpose. During the time the hen is sitting, it becomes necessary to place food near her; as otherwise, from her assiduity, she may be starved to death, as turkey-hens seldom move from their nest during the whole time of incubation.

Where farmers rear turkeys in great numbers, they do not indulge the hen by allowing her to sit as soon as she has done laying, but keep them from her until all the other hens have ceased to lay, as it is of consequence that they should all be hatched about one time.—When hens are unhappy during this interval, they may be indulged with hens' eggs. When they have all ceased to lay, each of them is provided with a nest ranged close to the wall, in a barn or other convenient place, and each is supplied with from sixteen to twenty of her own eggs. The windows and doors are then closed, and only opened once in the twenty-four hours for the admission of air, and for the purpose of feeding the hens. They are taken off their nests, fed and replaced, and again shut up.—On the twenty-sixth day, the person who is entrusted with the management of the birds examines all the eggs, and removes those that are addled; feeds the hens, and does not again disturb them till the poults have emerged from their shells, and have become perfectly dry, from the heat of the parent bird; as to be subjected to cold at this time would certainly kill them. When the young birds are thoroughly dried, two of the broods are joined together, and the care of them entrusted to a single hen; and those who have been deprived of their offspring are again placed on hens' or ducks' eggs, and subjected a second time to the tedious operation of incubation, in which case it is not unusual for them to bring out thirty eggs. We cannot recommend this practice in point of humanity; for the poor hens when they have accomplished their second sitting, are literally reduced to skin and bone, and frequently so weak as hardly to be able to walk.

As before hinted at, great care should be taken of the young turkey-poults; besides warmth, proper food, and shade, the nearer they are to a pure running stream the better, as they drink a great deal, and nothing is of greater importance to their being successfully reared than fresh drink. They must be also carefully protected from strong gusts of wind, and on the slightest appearance of a thunder-storm, should be immediately taken into a house. They should get no food for twenty-four hours after they leave the egg. Their first food should be hard-boiled eggs finely chopped, and mixed with crumbs of bread. Curd is also an excellent food for them. When they are about a week old, boiled peas and minced scallions are given to them. If eggs are continued, the shells should be minced down with their food, to assist digestion, or some very coarse sand, or minute pebbles. They should be fed thrice a day; and as they get older, a mixture of lettuce milk will be found beneficial, together with minced nettles. Barley boiled in milk is another excellent food at this period, and then oats boiled in milk. In short, the constitution of young turkeys requires at all ages every kind of stimulating food. When about three weeks old, their meat should consist of a mixture of minced lettuce, nettles, curdled milk, hard-boiled yolks of eggs, bran, and dried camomile; but when all these cannot be readily obtained, part of them must be used. Fennel and wild endive, with all plants which are of a tonic character, may be safely given to them. Too much lettuce, however, has been found to be injurious. When poults are about a month old, they should be turned out, along with the parent bird, into the fields or plantations, where they will find sufficient food for themselves. Grass, worms, all kinds of insects and snails, are their favorite food, and Nature dictates to them such vegetables as are conducive to their general health. As their feet are at first very tender, and subject to inflammation from the pricking of nettles and thistles, they ought to be rubbed with spirits, which has the effect of hardening the skin, and fortifying them against these plants.

The glandulous fleshy parts and barbles of their heads begin to develop when they are from six weeks to two months old. This is a critical period with the poults, and unusual care must be bestowed on them, as they now become weak and often sickly. A little brine mixed with their food will be found very beneficial, or spirits much diluted with water. A paste made of fennel, pepper, hemp-seed, and parsley, has been found an excellent remedy when afflicted with an inflammation in the wattles, to which they are liable when growing.—They are very subject to this if the weather happens to be broken and changeable at the time these tubercles are growing. These parts swell and grow very red, which frequently proves fatal to them. If, therefore, such be the state of the weather at this critical period, the paste above recommended should be given although they are perfectly healthy, which will be found an excellent preventive. When the inflammation becomes very great, recourse is often had to bleeding in the axillary vein, which frequently recovers them.

Soon after the turkey-poults have acquired their first feathers, they are liable to a disease which is very fatal to them, if not attended to. This distemper produces great debility, and the birds appear languid and drooping, and almost totally neglect their food. Their tail and wing-feathers assume a whitish appearance, and their plumage has a bristled aspect. This is occasioned by a disease in two or three of the rump-feathers. On examination, the tubes of these will be found filled with blood. The only remedy for this disease is to pluck them out, when the bird will speedily acquire its wonted health and spirits.

In fattening turkeys for the table, various methods are resorted to. Some feed them on barley meal mixed with skim-milk, and confine them a coop during this time; others merely confine them to a house; while a third class allow them to run quite at liberty; which latter practice, from the experience of those on whose judgment we can most rely, is by far the best method. Care should, however, be taken to feed them abundantly before they are allowed to range about in the morning, and a meal should also be prepared for them at mid-day, to which they will generally repair homewards of their own accord. They should be fed at night, before roosting, with oat-meal and skim-milk;

and a day or two previous to their being killed, they should get oats exclusively. We have found, from experience, that when turkeys are purchased for the table, and cooped up, they will never increase in bulk, however plentifully they may be supplied with food and fresh water, but, on the contrary, are very liable to lose flesh. When feeding them for use, a change of food will also be found beneficial.—Boiled carrots and Swedish turnips, or potatoes mixed with a little barley or oat-meal, will be greedily taken by them. A cruel method is practiced by some to render turkeys very fat, which is termed cramming. This is done by forming a paste of crumbs of bread, flour, minced suet, and sweet-milk, or even cream, into small balls about the bulk of a marble, which is passed over the throat after full ordinary meals.

The Guinea-Fowl.—This stranger is found native in Africa, as its name indicates, and it also exists in an indigenous state in South America. The Guinea-fowl or Pintado is about the size of the common hen, and the male differs very little in appearance from the female. Three species exist in considerable numbers in Europe, namely, the crested, the mitred, and Egyptian varieties. A very beautiful sort is marked by a pure white tint of body, but the most familiar hues are dark-grey and black.—The bird is less tame than other common poultry, and prefers to live in a half-wild condition in its native regions, perching and living on trees, like undomesticated birds. It is a spirited creature, and will battle even with the turkey. The guinea-hens require great attention at the time of laying, making their nests by preference in corners of the woods. The common hen is usually made to rear their broods. In the market, guinea-fowls always bear a high price, both on account of their flesh, which is of a good quality, and because they form a very pretty variety of the poultry stock. Their food is grain, of the various kinds given to ordinary barn-door fowls, with which they assimilate closely in habits.

The Goose.—The goose differs in many respects from the fowls already noticed, being aquatic in its habits. It is marked by a flat bill and webbed feet, characters also possessed by the duck and swan, which in conjunction with the goose, may be held as forming a distinct family *(Anatidæ)* of the feathered aquatic tribes.

Our common tame goose is the wild species domesticated, known to naturalists by the name of the fen or stubble-goose. Where people have a right of common, or live in the vicinity of marshy heaths, the breeding and rearing of geese will prove very profitable, for in such situations they are kept at a trifling expense; they are very hardy, and live to a great age. If properly kept, and fed regularly, although sparingly, they will lay upwards of a hundred eggs yearly. If these are set under large hens each having half a dozen, with the assistance of the goose herself, they may be nearly all hatched.—For the first three or four days they must be kept warm and dry, and fed on barley meal or oat-meal mixed with milk, if it is easily procured; if not, let these ingredients be mixed with water. They will begin to grow in about a week. For a week or two the goslings should not be turned out till late in the morning, and should always be taken in early in the evening. In Ireland, the tenantry depend much on the breeding of these birds and turkeys to pay their rent; and with those who are industrious and favorably situated for rearing geese, they even do more in many instances. In the early part of the year they are allowed to feed on grass, on heaths, meadows, and commons; and as most of the peasantry have small bits of corn land of their own, the geese are turned out on the stubble to pluck what grass is is left; and they also fatten upon it, and improve the flavor of their flesh.

Although water be the natural element of geese, yet it is a curious fact that they feed much faster in situations remote from rivers and streams. To fatten geese it is necessary to give them a little corn daily, with the addition of some raw Swedish turnips, carrots, mangel-wurzel leaves, lucerne, tares, cabbage leaves, and lettuces. They should not be allowed to run at large when they are fattening, as they do not acquire flesh nearly so fast when allowed to take much exercise. Therefore, those who can only afford to bring up a goose or two, should confine them in a crib or some such place about the beginning of July, and feed them upon the ingredients above recommended, with a daily supply of clean water for drink. If, on the contrary, from a dozen to twenty are kept, a large pen of from fifteen to twenty feet square must be made, and well covered with straw in the bottom, and a covered house in a corner for protection against the sun and rain when required, because exposure to either of these is not good. It will be observed that, about noon, if geese are at liberty, they will seek some shady spot to avoid the influence of the sun; and when confined in small places, they have not sufficient room to flap their wings and dry themselves after being wetted; nor have they room to move about so as to keep themselves warm. There should be three troughs in the pen, one for dry oats, another for vegetables—which ought always to be cut down—and a third for clean water, of which they must always have a plentiful supply. It must be remembered that the riper the cabbages and lettuces which they are supplied with the better. In the neighborhood of large towns, the most profitable way of disposing of geese is in a dead state; as nearly the same sum can be obtained for them as if they were alive, and then you have the feathers, which are valuable, and may be sold to much advantage by themselves when you have collected a stone weight or more.

Geese are kept in vast quantities in the fens of Lincolnshire, several persons there having as many as a thousand breeders. They are bred for the sake of their quills and feathers, as well as for their carcass; it is therefore customary to strip them partially of the fine downy feathers, and leave them to grow afresh, and also to take quills from their wings—both practices barbarous in the extreme, however they may be attempted to be justified. Geese breed in general only once a year, but if well kept, they sometimes hatch twice in a season. The best method for promoting this is to feed them with corn, barley, malt, fresh grains, and, as a stimulant, they should get a mixture of pollard and ale.—During their sitting, each bird has a space allotted to it, in rows of wicker pens placed one above another, and the goose-herd who has the care of them drives the whole flock to water thrice a-day, and, bringing them back to their habitation, places every bird (without missing

one) in its own nest. One gander is generally put to five geese. The time of incubation varies from twenty-seven to thirty days. The goose begins to lay in March, but the time of the month depends upon the state of the atmosphere. When goslings are first allowed to go at large with their dam, every plant of hemlock which grows within the extent of their range should be pulled up, as they are very apt to eat it, and it generally proves fatal to them. Night-shade is also equally pernicious to them, and they have been known to be poisoned by eating sprigs of yew-tree.

Ducks.—Ducks are a kind of fowl easily kept, particularly near ponds or streams of water. In such situations, even the poorest families may have half a dozen of them running about without the least inconvenience. In keeping them in a domestic state, one drake is usually put to five ducks. The ducks begin to lay in February; their time of laying being either at night or early in the morning. They are extremely apt to deposit their eggs in some sequestered spot, and to conceal them with leaves or straw. From eleven to fifteen eggs is the number which a duck can properly cover. The time of incubation is about thirty-one days. The place where they incubate should be as quiet and retired as possible: and if they have liberty, they will give no trouble whatever in feeding, as the duck, when she feels the call of hunger, covers her eggs carefully up, and seeks food for herself, either by going to the streams or ditches in her neighborhood, or, if such are not at hand, she will come to the cottage and intimate her wants by her squalling. When the young are hatched, they should be left to the care of the duck, who will lead them forth in due time; and when she does so, prepare a coop for them, which should be placed on short grass, if the weather is mild; and if cold or stormy, they should be kept under cover. The future strength of the brood will depend much upon the care that is taken of them for the first three or four weeks after they have emerged from the shell. Ducklings will begin to wash themselves the first day after they are hatched, if they find water at hand. Therefore, a flat dish filled with that element should be always within their reach. Many persons are in the practice of clipping the tail, and the down from beneath it, in ducklings, if the weather is wet during the first weeks of their existence. This to prevent them from dragging themselves, which has a tendency to produce intestinal diseases. From a fortnight to three weeks is all that is necessary to confine them to the coop.

The first thing on which ducklings are fed is a mixture of barley, peas, or oat-meal, and water. They may afterwards be fed upon a mixture of buckwheat and any of the above-named meals. The greatest attention must be paid to keeping their bed warm and dry; and with young ducks a frequent change of straw is absolutely necessary, as their beds soon get dirty and wet.

Ducks are not such attentive guardians of their young as hens, and therefore it is a common practice to place duck eggs under a sitting hen, and leave her to hatch them as her own progeny. When the young ducks so hatched make their appearance, the hen does not appear aware of the imposition, but takes at once to her duties with all a mother's fondness. The natural desire of the ducklings to plunge into water and swim away from the shore vexes her, but she watches for their return, and does all in her power to provide the means of subsistence. She scrapes for them, which a duck would not; she shelters them under her dry and warm bosom and wings, and altogether makes a better nurse than their own proper parent.

In feeding ducks for use, peas and oat-meal are to be preferred. It is said that barley meal renders their flesh soft and insipid. Bruised oats should be given to them freely for some weeks before they are killed, which renders their flesh solid and well tasted; and the same general principles recommended in the feeding of geese should be kept in view. It has been found that the offal of butchers' shops feeds ducks quickly, and that this does not impair the flavor of their flesh. In very many instances, ducks are reared in situations where there are no pools of clean water for them to dabble in, and the poor animals are compelled to grub with their bills in all sorts of nauseous puddles, which, of course, makes their flesh rank and offensive. They should in all cases have a pool of clean water to swim in, and are best reared near a natural meadow, where they can search for their appropriate food.

Those who have paid much attention to the management of domestic poultry, assert that geese and ducks should be kept apart from other fowls. The former should have their houses ranged along the banks of a piece of water with a fence, and sufficiently extensive for walks in front, with doors for their access to the water, which can be closed at pleasure.

Swans.—Swans are a class of aquatic fowls kept for ornament rather than use. The flesh, even of the young, is black, hard, and rank, while that of the old is too tough for mastication. The eggs, also, are not peculiarly palatable; and there is little inducement to rear them, in short, if mere pecuniary advantage be looked to, excepting on the score of the skin, feathers, and down, which are articles of considerable value. At the same time, if the swan be not a productive bird, few animated objects can be compared with it as regards ornament. Its great size, snow-white plumage, and graceful form, render it a most attractive spectacle upon the bosom of a pool or loch. It is a hardy, long-lived fowl, and associates in pairs. The food of the swan consists usually of seeds, roots, and plants, rendered succulent by water. When fed in a barn-yard it seldom thrives, being more decidedly aquatic in its habits than ducks or geese. From the color of the European swan being so uniformly white, a black swan used once to be proverbially spoken of as an impossibility, but black swans have been found of late in Australia.

Pigeons.—Pigeons are among the most ornamental and useful appendages of a rural dwelling. If permitted to fly abroad to seek their food, little expense will be incurred for their keep, while the value of their young will be of some importance to cottagers. The pigeon has a great power of flight, and will go to a distance of many miles in quest of the means of subsistence; but wherever it may fly, it never fails to return home. The leading features of the district around its habitation appear to be impressed on its memory, and, flying at a great hight, and with a wonderful power of vision, it sees the well-remembered landmarks, and directs its path homeward. This habit of seeking for the place at which it was reared, makes it difficult to keep pigeons in any new home;

the best plan of inducing them to settle in a new abode, is to clip one wing, which prevents their flying; and keep them in a cot near the ground, till they get accustomed to the place.

Many persons keep their pigeons in the space between the garret and roof of their dwelling house, with holes at which they go out and in; and this arrangement answers very well, for the animal's lodging must be dry and comfortable. A more regular plan is to furnish them with a properly-constructed dove-cot, aloof from any building. The cot should consist of a substantial wooden box, with a sloping roof, and divided interiorly by partitions into as many cells as pairs are to be kept, for each pair requires a distinct cell. Each cell should be twelve inches deep from front to back, and sixteen inches broad; the entrance hole should not be opposite the centre of the cell, but at a side, so that the pigeons may build their nest a little out of sight. In front of each cell there should be a slip of wood to rest and coo upon; but as different pairs incessantly quarrel about the right of walking on these slips, and are apt to fight for the possession of cells, it is best to separate the slips with upright partitions; and it would be an improvement to have two or three small cots instead of one large one. The cot, of whatever size or form, should be elevated on a wall facing the south-east, or otherwise placed at such a hight as will be out of the reach of cats and other vermin. The cot should be painted white, as the pigeon is attracted by that color. Gravel should be strewed on the ground in front of the dove-cot, the birds being fond of picking it; and a little straw or hay is necessary for the nests. Cleanliness is indispensable to the health of the birds, and a scouring out of the cot should therefore take place regularly. The quantity of dung produced in the nests is very great, and its removal to the compost heap will amply repay the trouble of cleaning.

In commencing to keep pigeons, a pair or two should be procured which have not flown, and they should be shut up for a time, and well fed. Their chief food is grain, and the kind which they prefer to all others is dried tares. Small horse-beans are another favorite article of diet, and very nutritious to them. Wheat, barley, oats, and peas, with rape, hemp, and canary seeds, are also prized by them, but should not be made constant articles of food under any circumstances.

The house-dove or common pigeon, as is well known, begins to breed about the age of nine months, and breeds every month. During breeding time, they associate in pairs, and pay court to each other with their bills; the female lays two eggs, and the young ones that are produced are for the most part a male and female. When the eggs are laid, the female, in the space of fifteen days, not including the three days during which she is employed in laying, continues to hatch, relieved at intervals by the male.—From three or four o'clock in the evening, till nine the next day, the female continues to sit; she is then relieved by the male, who takes his place from ten till three, while his mate is feeding abroad. In this manner they sit alternately till the young come out. Kept with ordinary care a pair will give to the breeder nine pairs or so in a year, and will continue to do this for four years.

With regard to the best breeds of the common domesticated pigeon, it is difficult to give any useful instructions. They have been cultivated to a great extent, and many distinct varieties have been formed, but the differences rest chiefly in colors, and the special value of each lies in the taste of the *fancier*. The leading varieties of fancy pigeons are known by the names of the English Pouter, the Dutch Cropper, the Horseman, the Unloper, the Dragoon, the Tumbler, the Leghorn and Spanish Runt, the Trumpeter, the Nun, the Fan-tail, and the Capuchin. The peculiarities of some of these breeds are very odd. The tumbler, for instance, derives its name from a practice of tumbling in the air while on the wing. Instead of pursuing a steady straightforward flight, it turns over, or casts somersets backward, whirling round heels over head as expertly as a first-rate rope-dancer does when he makes the back spring. The fan-tail derives its name from the circumstance of its having a remarkably broad tail, which it has the power of spreading out like the tail of a turkey-cock. The prime quality of the bird consists in its ability to make its tail touch its head, and surround it with a wide glory of feathers, If it cannot do this, it is valueless to the fancier, no matter how excellent are its other properties. Amusing as this absurdity is, it is not so laughable as the qualities which recommend the English pouter to public favor. This bird, which is a cross between a Horseman and Cropper, possesses the remarkable property of blowing out its breast or crop to such an extent that it rises to a level with its beak, and the bird appears to look over the top of an inflated bladder.

Carrier Pigeons.—Pigeons have been put to the remarkable purpose of acting as carriers for letters or other light objects. A particular species, larger than common, is trained for the purpose, and in some countries the rearing of them forms a lucrative employment. The instinct which has rendered the carrier-pigeon so serviceable, is the strong desire manifested by all pigeons to return to the place of its ordinary residence; and man has adopted various precautionary measures in order to makes its return on particular occasions more certain. A male and female are usually kept together and treated well; and one of these, when taken elsewhere, is supposed to have the greater inducement to come back. It is even considered necessary by some that the bird should have left eggs in the process of incubation, or unfledged young ones, at home, in order to make the return certain; but probably these are superfluous precautions. It is obvious that the carrier-pigeon can only be put to use in conformity with some contemplated plan, for which the proper preparations have been made. It must have been taken from a place to which it is wished that it should return, and it must, at the moment when its services are wanted, be temporarily at the place from which the intelligence is to be conveyed. It is usually taken to that place hoodwinked, or in a covered basket; the instinct by which it finds its way back upon its own wings, must of course be independent of all knowledge of the intermediate localities. When the moment for employing it has arrived, the individual requiring its services writes a small billet upon thin paper, which is placed lengthwise under the wing, and fastened by a pin to one of the feathers, with some precautions to prevent the pin from pricking, and the paper from filling with air. On being released, the carrier ascends to a great hight, takes one or two turns in the air, and then commences its forward career, at the rate of forty miles in the hour, or about a thousand a day.

SUCCESSFUL EXPERIMENTS IN SOILING,

AVERAGE PRODUCE OF WHEAT IN OHIO—HOW MUCH WHEAT PER ACRE WILL PAY.

When to soil milch cows—and when not—is a problem to be solved by a consideration of circumstances which can only be duly taken into account by every man for himself—for he only can know the quantity and kinds of food he will have at command—the extent and nature of the pasturage to be referred to in making the comparison, the expense of labor, and other items necessary to a safe conclusion. The question in itself is one of so much practical importance, that we shall occasionally present such views of it as fall within our reach, leaving the intelligent reader to decide how the circumstances tally with his own. About one thing there can be no mistake—that if we would stay the general progress of the country towards extreme exhaustion—prompting land-holders, even in comparatively new States, to sell out, and clear out; we must be more universally and deeply impressed with the indispensable importance of every year collecting the greatest quantity of manure *that can from every source and by every means be accumulated*—for not a plant of tobacco or corn can be reared, not a stalk of grain can be reaped, nor a spear of grass be cut, nor a potato dug, that does not subtract something much beyond what it can restore to the soil. Hence it is that already the fine wheat lands of Western New-York have been brought down, (for example, in Seneca County,) on the undenied belief of the most experienced and intelligent millers in Rochester, to an average of only ten or eleven [from twenty] bushels an acre—an amount of which the most careless tenant or cultivator in England would be ashamed, and one which *will not pay* expenses of production in any slave-holding country, where wheat is the principal crop. We say in a slave-holding country, because there, there are many idle months not employed in its cultivation. Wheat, or what we call small grain crops, are those to the production of which labor may and should be exactly adapted—that is to say, there should be no superfluous idle months, if avoidable, consuming the substance of the farm and the farmer in the long interval between sowing and reaping. Growing wheat is a case in which the expense of outlay and income may be calculated with more exactness than can be attained in most others, and we should much doubt whether, in Maryland or Virginia, a *wheat estate*, especially one at any distance from tide water and a market, can pay expenses where the yield is not over ten bushels to the acre, and the net market price not over $1, after charging say *three per cent* on the value of the land, or what the owner would ask for it, and deducting all expenses of inanimate and animate power—kept all the year, whether at work on the wheat or not—we should be glad to have the views and figures of some of our friends on this point.

In a clear and intelligent circular of a distinguished house in New Orleans—Gordon, Wiley & Co.—they state that the average product of *Ohio* even, that comparatively new and fertile State, is not over ten bushels of wheat to the acre—and there, too, the land-killer, seeing the prospect before him, is falling into and swelling the stream of emigration as it passes his door, to the Far West.

The prominent advantages of soiling, our readers need not be told, is that it may be practiced on a smaller quantity of land than is necessary under an exclusively grazing system, and yet more, that it contributes to the *accumulation of manure*. And the young farmer must be blind and infatuated, he must wilfully shut his eyes against the ruin that is coming to overtake him, as surely as the sparks fly upwards, if he does not somehow contrive to restore, year by year, to his land, as much of the elements necessary to sustain his crops as these crops take and carry away from it, whenever they are carried to market for sale. The process of exhaustion may be slower or faster, according to circumstances, but his land that is cropped can no more re-fertilize and invigorate itself, than his pocket can replenish itself with that money which has, according to Scripture, made itself wings and flown away. It is to be regretted that the comparative *results* of soiling and pasturage were not more exactly given in the following, which we find in that excellent Journal, the London Agricultural Gazette. It is clear, however, that the experimenter was satisfied with the result of the soiling part of the experiment. The reader will note, without being prompted, that Mr. Smith says—"About one-fourth part of the labor

of a man was sufficient for cutting and carrying the grass, and with the aid of a pony and cart, when the place from which he had to carry the food became distant. He also supplied the cows with straw and water, and carried out the dung, and he dressed the cows once a day, with a whalebone brush."

The question here suggests itself—whether the same work would not occupy the whole time, and even more than the time of one laborer, slave or hired man, in our country? When Mr. Colman expressed the belief that a laboring man in England "does not accomplish nearly as much as an American laborer," he adds, in way of explanation—"I speak of cases in which the American is working for himself, the Englishman for another. In cases where work is taken by the piece or job, as in harvest, for example, there seems to be no want of application or success, on the part of the English laborer."

This is probably the true solution of the success of the Eastern farmers, who on very small farms, are seen to rear their families in comfort and credit. The work is mostly done by the farmer himself, or his family; all of whom feel a common interest in the result. But for hired free labor in this country, left to itself, and unaccompanied and unobserved by the employer, we much doubt whether the performance is equal to that of European laborers. It is difficult, in fact, to find American hirelings. Every man, happily, is setting up for himself—few that do n't aspire to, and few who do not succeed in getting freeholds for themselves. On the Indian Hill farm, where management, industry and sagacity go hand in hand, preference is given to Scotch laborers. For interesting remarks on the difference between animal and mental force, and a comparison of the physical strength of men of different nations, see the chapter on these subjects, in this number of the Farmers' Library.

In the summer of 1841, a dairy of 20 cows, consisting of part Ayrshire breed, and part a cross from Ayrshire cows and a short-horned bull, were separated into two lots of 10 each, selected to be as equal as possible, in point of carcass, condition, and milking quality. The one lot was, about the beginning of May, put to pasture in the usual manner, going to the field about seven in the morning, after having been milked, again being brought home to be milked about one o'clock, and again being driven out at two o'clock to the field; and at seven in the evening again being brought home to be milked, and remaining in the house all night, having some turneps and straw, during the first few weeks, and thereafter cut grass. Towards midsummer they were put out all night, and kept in the house from twelve till four, getting cut grass, vetches, and a little straw; and from 1st September, being again kept in all night, getting cut grass, vetches, and straw. The cows of the other lot were tied up in a wooden house, erected for the purpose, in a field of sown grass, from which they were to be fed, near a field of vetches. The byre was constructed to hold five cows at each end, with boards to open in front of each cow, to let the grass be put into their stalls, and to admit an abundance of fresh air during the day. There was a large tun or cask sunk in the ground outside the house, to receive the urine flowing from the cows; near this tank the dung from the cows was placed in layers on the surface of the ground, and the water was occasionally taken from the tank in buckets, and thrown over the dung to keep it moist, and to promote its decomposition, channels being formed in the ground round the dung-heap to conduct such fluid as might flow from the heap into the tank. The cow-water being so repeatedly passed through the dung-heap, whilst it promoted its conversion to well-made dung, became itself enriched, and was in a fit state for being applied to the surface of the ground as a liquid manure. These cows were fed with cut grass from the field in which the house was placed and, towards the latter part of the season, with a proportion of vetches cut from an adjoining field. About one-fourth part of the labor of a man was sufficient for cutting and carrying the grass, and with the aid of a pony and a cart, when the place from which he had to carry the food became distant. He also supplied the cows with straw and water, and carried out the dung, and he dressed the cows once a day with a whalebone brush. The cows were never removed from their stakes from the time they were put up until the 1st of November, when they were taken back to the dairy, to be tied up for the winter with the other cows, excepting when they had to be taken to receive the bull. It required some care on the part of the keeper to observe when they came into condition for that process. The cows thus treated were milked three times a day, as the others were—they gave their milk more uniformly and more plentifully, and continued throughout in excellent health and improved in condition from 30s. to 40s. per head over those at pasture. When removed to the dairy they still continued in excellent health and condition during the winter, and had their calves in spring in proper time, and of large and healthy frame. The manure made was of value, considerably above the extra charge for management; and the cows were kept in summer on three quarters of a statute acre each. Those on pasture required only one and a quarter acre of pasture, and nearly a quarter acre for cut grass and vetches; so that, upon the whole, about one-half of the extent of ground necessary for the summer keep of cows at pasture was sufficient for those kept in the house.

[Ayrshire Agriculturist.

ANIMAL AND MENTAL FORCE.

Difference between them—Strength of men of different Nations compared.

In every industrial occupation there are actually involved two totally distinct offices, which are paid for in very different degrees. These are the animal force, and the mental exertion which directs it. The question of relative cheapness or dearness of labor altogether depends on the relative proportions we want of those, and the proportions in which they are possessed by the man we hire. Now, owing to the general absence of industrial activity in this country, the mental power is not at all so universal as in Britain. It is hence dearer in

Ireland, whilst animal force, destitute of industrial skill, being less abundant in Great Britain, is dearer there than it is with us. A bricklayer in London gets 30s. per week, and his laborer 14s.; a bricklayer in Dublin gets 18s. per week, and his laborer but 8s. These proportions are often said to be caused by combination and threats against employers. It is not so; the fact being that men who know how to set bricks are proportionally more abundant in London, and men who do not know how to do it are more abundant with us. This diversity produces both the power of combining and the difference of wages.

Considering man merely as a source of animal power, it is gratifying to have it proved, that when at all well fed, there is no race more perfectly developed, as to physical conformation, than the inhabitants of this island. Professor Forbes instituted an extensive series of observations of the size and strength of the students attending the University of Edinburgh, who may be considered as fairly representing the middle classes of their respective countries; and I have subjoined the similar results of Professor Quetelet, regarding the students of the University of Bruxelles. The strength indicated is that shown by pulling out the stem of a spring dynamometer.

	Av. height in inches.	*Av. weight in pounds.*	*Av. strength in pounds.*
English.	68½	151	403
Scotch.	69	159½	423
Irish....	70	155	492
Belgians.	68	150	389

The Irish are thus the tallest, strongest, and heaviest of the four races.

Mr. Field, the eminent mechanical engineer of London, had occasion to examine the relative powers of British and Irish laborers to raise weights by means of a crane. He communicated his results to the Institute of Civil Engineers in London. He found that the utmost effort of a man lifting at the rate of one foot per minute ranged:

Englishmen, from 11,565 lbs. to 24,055
Irishmen, - 17,385 - 27,562
The utmost effort of a Welshman was 15,112.

AGRICULTURAL RESOURCES AND PRODUCTS OF THE UNITED STATES AND GREAT BRITAIN.

There are so many occasions in the prosecution of practical inquiry that demand the means of ready reference to the most authentic reports of the agricultural products of the country, that we have concluded to transfer the following tables to our columns, from "Tucker's Progress of the United States," in which we find, in the most convenient form, the only philosophical and reliable use that has been made of the census of our population and industry up to 1840.

Would that it were within the bounds of possibility that some such man as he or Chancellor Bland of Maryland, with minds elevated far above the murky atmosphere of party, could be employed to frame the instructions for taking the next census—and for presenting biennially, which would be often enough, through the National Institute, or otherwise, authentic data, and politico-economical suggestions, on the existing resources of the country, and the means of their farther development and direction. How much more permanently useful—how much better calculated to command respect and confidence, than the crude, ill-digested, vague and unofficial scraps, gathered and strung together from agricultural and other papers, and sprinkled here and there with Munchausen stories, merely to *make a momentary sensation!* until the season comes round for hatching out a new brood of humbugs, and for the letting loose of which indictments ought to be issued as for spreading false information.

There is such a general and natural disposition among all inquiring readers and statesmen, and we may presume legislators who represent the agricultural interest of the country, to compare the elements of our national subsistence and growth with those of the country from which we sprung, and with which we have most commercial and social intercourse: the country whose constitution and laws we have most nearly followed, whose language we speak and whose blood we inherit—and, for all these reasons the nation with which we should be most desirous of maintaining, not merely peaceable, but friendly relations; that we presume it may prove not merely acceptable, but useful to give also, as will be found, the most recent and authentic views of the *wealth and resources of the British Empire.*

We are reluctant to believe that in appropriating so little space for information so condensed, we shall be met by the narrow-minded inquiry —What light do these tables throw on the way to make the *most corn grow on an acre of land!* That has been taught in agricultural annals and essays thirty years ago, and a thousand times over, but it is no small gratification to us to believe that our patrons will be pleased to have their minds invited to the contemplation of and inquiry into subjects which lie beyond, though in a political or literary point of view they are closely connected with, what is growing in their own fields. If we are mistaken in this, we have counted without our host in the establishment of a Farmers' Library.

AGRICULTURE.

LIVE STOCK—CEREAL GRAINS.

STATES AND TERRITORIES.	LIVE STOCK.					CEREAL GRAINS.					
	Horses & Mules.	Neat Cattle.	Sheep.	Swine.	Est. Value of Poultry.	Bushels of Wheat.	Bushels of Barley.	Bushels of Oats.	Bushels of Rye.	Bushels of Buckwh't.	Bushels of Indian Corn.
Maine	59,208	347,255	649,264	117,380	$123,171	818,166	355,161	1,076,409	137,941	51,543	950,598
New Hampshire	43,892	275,562	617,390	121,671	107,092	422,124	121,899	1,296,114	308,148	105,163	1,162,572
Massachusetts	61,481	282,574	378,226	143,221	178,157	157,923	165,319	1,319,680	536,014	87,000	1,809,192
Rhode Island	8,024	36,991	90,146	30,659	61,709	3,098	66,400	171,517	34,521	2,979	450,498
Connecticut	34,650	238,050	403,462	131,961	176,629	87,009	33,759	1,153,962	737,194	303,013	1,509,441
Vermont	62,402	384,311	1,681,819	203,800	231,578	495,800	51,781	2,292,581	230,993	298,416	1,119,678
New York	474,543	1,911,214	5,118,577	1,000,065	1,153,413	12,286,418	2,520,068	20,675,917	2,979,393	2,287,885	10,972,986
New Jersey	70,502	290,202	219,285	261,443	336,953	771,203	12,501	3,083,591	4,605,820	856,117	4,361,975
Pennsylvania	365,129	1,172,665	1,767,620	1,503,964	685,801	13,213,077	209,193	20,641,819	6,613,873	2,113,742	14,240,022
Delaware	14,421	53,883	39,247	74,228	47,765	315,165	5,260	927,405	33,546	11,299	2,099,359
Maryland	92,220	225,714	237,922	416,913	218,765	3,345,783	3,594	3,534,911	723,577	73,606	8,233,086
Virginia	326,438	1,024,148	1,293,772	1,092,155	754,698	10,109,716	87,430	13,451,069	1,482,799	243,829	34,377,591
North Carolina	166,608	617,371	538,279	1,649,716	514,125	1,960,855	3,574	3,193,941	213,971	15,391	23,893,763
South Carolina	199,921	572,609	232,981	878,539	396,364	968,354	3,967	1,186,208	44,738	72	14,292,805
Georgia	157,510	884,414	267,107	1,457,755	449,623	1,801,830	12,979	4,010,030	60,693	141	20,905,122
Alabama	143,147	668,018	163,243	1,493,973	404,934	898,052	7,692	1,406,353	31,008	58	20,947,001
Mississippi	109,297	623,197	128,367	1,001,909	369,182	196,626	1,654	668,694	14,444	61	13,161,237
Louisiana	99,898	381,248	98,672	323,230	283,559	60	.....	107,353	1,812	.....	5,952,912
Tennessee	341,409	829,851	741,593	2,926,607	606,969	4,569,692	4,809	7,055,678	304,320	17,118	44,986,188
Kentucky	395,853	787,098	1,008,240	2,310,533	536,139	4,803,152	17,491	7,155,974	1,321,373	8,169	39,847,120
Ohio	430,527	1,217,874	2,028,401	2,099,746	551,193	16,571,661	212,440	14,393,103	814,205	633,139	33,668,144
Indiana	241,036	619,980	675,982	1,623,608	357,591	4,019,375	98,015	5,081,605	129,621	19,019	28,155,887
Illinois	196,235	626,274	395,672	1,495,254	309,204	3,335,393	82,951	4,088,009	88,197	57,801	29,634,211
Missouri	196,032	433,875	348,018	1,271,161	270,647	1,637,396	9,801	2,234,917	68,608	15,318	17,332,594
Arkansas	51,472	188,786	42,151	393,058	109,468	105,878	760	189,553	6,210	88	4,846,639
Michigan	30,144	185,190	99,618	295,890	82,730	2,157,108	125,802	2,111,051	34,236	113,592	2,277,039
Florida	12,043	118,081	7,198	92,680	64,007	412	30	13,809	305	.....	998,074
Wisconsin	5,735	30,909	3,462	51,383	16,167	212,146	11,063	406,514	1,965	10,634	379,359
Iowa	10,794	39,049	15,354	101,899	16,529	154,693	728	216,305	3,799	6,219	1,406,241
District of Columbia	2,145	3,274	706	4,674	3,099	12,147	294	15,751	5,081	272	39,485
Total	4,335,669	14,971,586	19,311,374	26,301,293	9,344,410	84,893,279	4,161,501	123,071,341	18,645,567	7,291,743	377,531,875

AGRICULTURE.....VARIOUS CROPS.

WOOL—HOPS—WAX—POTATOES—HAY—HEMP AND FLAX—TOBACCO—RICE—COTTON.

STATES AND TERRITORIES.	Wool. *Pounds.*	Hops. *Pounds.*	Wax. *Pounds.*	Potatoes. *Bushels.*	Hay. *Tons.*	Hemp & Flax. *Tons.*	Tobacco Gathered. *Pounds.*	Rice. *Pounds.*	Cotton Gathered. *Pounds.*
Maine	1,465,551	36,940	3,723½	10,392,280	691,358	38	30	.....	.....
New-Hampshire	1,260,517	243,425	1,345	6,206,606	496,107	26½	115	.....	.....
Massachusetts	941,906	254,795	1,196	5,385,652	569,395	2½	64,955	.....	.....
Rhode Island	183,830	113	165	911,973	63,449	¼	317	.....	.....
Connecticut	889,870	4,573	3,897	3,414,238	426,704	41¾	471,657	.....	.....
Vermont	3,699,235	48,137	4,660	8,869,751	836,739	29½	585	.....	.....
New-York	9,845,295	447,250	52,795	30,123,614	3,127,047	1,130⅝	744	.....	.....
New-Jersey	397,207	4,531	10,061	2,072,069	334,861	2,165¾	1,922	.....	.....
Pennsylvania	3,048,564	49,481	33,107	9,535,663	1,311,643	2,649¾	325,018	.....	.....
Delaware	64,404	746	1,088	200,712	22,483	52¾	272	.....	334
Maryland	488,201	2,357	3,674	1,036,433	106,687½	488	24,816,012	.....	5,673
Virginia	2,538,374	10,597	65,020	2,944,660	364,708½	25,594¼	75,347,106	2,950	3,494,483
North-Carolina	625,044	1,063	118,923	2,609,239	101,369	9,879⅓	16,772,359	2,820,388	51,926,190
South-Carolina	299,170	93	15,857	2,698,313	24,618	.....	51,519	60,590,861	61,710,274
Georgia	371,303	773	19,799	1,291,366	16,969¾	10¾	162,894	12,384,732	163,392,396
Alabama	220,352	825	25,226	1 708,356	12,718	5	273,302	149,019	117,138,823
Mississippi	175,196	154	6,835	1,630,100	171	16	83,471	777,195	193,401,577
Louisiana	49,283	115	1,012	834,341	24,651	.....	119,824	3,604,534	152,555,368
Tennessee	1,060,332	850	50,907	1,904,370	31,233	3,344½	29,550,432	7,977	27,701,277
Kentucky	1,786,847	742	38,445	1,055,085	88,306	9,992¼	53,436,909	16,376	691,456
Ohio	3,685,315	62,195	38,950	5,805,021	1,022,037	9,080¼	5,942,275	.....	.....
Indiana	1,237,919	38,591	30,647	1,525,794	178,029	8,605½	1,820,306	.....	180
Illinois	650,007	17,742	29,173	2,025,520	164,932	1,976¼	564,326	460	200,947
Missouri	562,265	789	56,461	783,768	49,083	18,010¾	9,067,913	50	121,122
Arkansas	64,943	.....	7,079	293,608	586	1,039½	148,439	5,454	6,028,642
Michigan	153,375	11,381	4,533	2,109,205	130,805	755¼	1,602	.....	.....
Florida	7,285	.....	75	264,617	1,197	2	75,274	481,420	12,110,533
Wisconsin	6.777	133	1.474	419,608	30,938	2	115	.....	.....
Iowa	23,039	83	2,132	234,063	17,953	313¼	8,076	.....	.....
District of Columbia	707	28	44	12,035	1,331	.....	55,550	.....	.....
Total	35,802,114	1,238,502	628,303½	108,298,060	10,248,108¾	95,251¾	219,163,319	80,841,422	790,479,275

AGRICULTURE.

SILK—SUGAR—WOOD—DAIRIES—ORCHARDS—WINE—FAMILY GOODS, &c.

HORTICULTURE.

GARDENS—NURSERIES.

STATES AND TERRITORIES.	Silk Cocoons. *Pounds.*	Sugar Made. *Pounds.*	Wood Sold. *Cords.*	Dairy Products. *Value.*	Orchard Products. *Value.*	Wine Made. *Gallons.*	Family Goods. *Value.*	GARDENS. Market Produce. *Value.*	GARDENS. Nursery Produce. *Value.*	NURSERIES. Men Empl'd	NURSERIES. Capital Invested.
Maine	211	257,464	205,011	$1,496,902	$149,384	2,236	$804,397	$51,579	$460	689	$84,774
New-Hampshire	419⅞	1,162,368	116,266	1,638,543	239,979	94	538,303	18,085	35	21	1,460
Massachusetts	1,741	579,227	278,069	2,373,299	389,177	193	231,942	283,904	111,814	292	43,170
Rhode Island	458	50	48,666	223,229	32,098	803	51,180	67,741	12,604	207	240,274
Connecticut	17,538	51,764	159,062	1,376,534	296,232	2,666	226,162	61,936	18,114	202	126,346
Vermont	4,286	4,647,934	96,399	2,008,737	213,944	94	674,548	16,276	5,600	48	6,677
New-York	1,735⅔	10,048,109	1,058,923	10,496,021	1,701,935	6,799	4,636,547	499,126	75,980	525	258,558
New-Jersey	1,966	56	340,602	1,328,032	464,006	9,416	201,625	249,613	26,167	1,233	125,116
Pennsylvania	7,262½	2,265,755	269,516	3,187,292	618,179	14,328	1,303,093	232,912	50,127	1,156	857,475
Delaware	1,458⅔	.....	67,864	113,828	28,211	322	62,116	4,035	1,120	9	1,100
Maryland	2,290½	36,266	178,181	457,466	105,740	7,585	176,050	133,197	10,591	619	48,841
Virginia	3,191	1,541,833	403,590	1,480,488	705,765	13,911	2,441,672	92,359	38,799	173	19,900
North-Carolina	3,014	7,163	40,034	674,349	386,006	28,752	1,413,242	28,475	48,581	20	4,663
South-Carolina	2,080	30,000	171,451	577,810	52,275	643	930,703	38,187	2,139	1,058	210,980
Georgia	2,992¼	329,744	57,459	605,172	156,122	8,647	1,467,630	19,346	1,853	418	9,213
Alabama	1,592¼	10,143	60,955	265,200	55,240	177	1,656,119	31,978	370	85	58,425
Mississippi	91	77	118,423	359,585	14,458	12	682,945	42,896	499	66	43,060
Louisiana	317	119,947,720	202,867	153,069	11,769	2,884	65,190	240,042	32,415	349	359,711
Tennessee	1,217	258,073	104,014	472,141	367,105	653	2,886,661	19,812	71,100	34	10,760
Kentucky	737	1,377,835	264,222	931,363	434,935	2,209	2,622,462	125,071	6,226	350	108,597
Ohio	4,317½	6,363,386	272,527	1,848,869	475,271	11,524	1,853,937	97,606	19,707	149	31,400
Indiana	379	3,727,795	183,712	742,269	110,055	10,265	1,289,802	61,212	17,231	309	73,628
Illinois	1,150	399,813	134,549	428,175	126,756	474	993,567	71,911	22,990	77	17,515
Missouri	70	274,853	81,981	100,432	90,878	22	1,149,544	37,181	6,205	97	37,075
Arkansas	95	1,542	78,606	59,205	10,680	.....	489,750	2,736	415	8	6,036
Michigan	266	1,329,784	54,498	301,052	16,075	.....	113,955	4,051	6,307	37	24,273
Florida	124¾	275,317	9,943	23,094	1,035	.....	20,205	11,758	10	60	6,500
Wisconsin	½	135,288	22,910	35,677	37	.....	12,567	3,106	1,025	89	85,616
Iowa	.....	41,450	7,304	23,609	50	.....	25,966	2,170	4,200	10	1,698
District of Columbia	651	.....	1,287	5,566	3,507	25	1,500	52,895	850	163	42,933
Total	61,559½	155,100,809	5,088,891	33,787,008	7,256,904	124,734	29,023,380	2,601,196	593,534	8,553	2,945,774

POPULATION AND RESOURCES OF THE BRITISH EMPIRE.

An account of the population of the empire has been taken at intervals of ten years from 1801; and the following table will show the gradual increase which has occurred during these intervals:—

	1801.	1811.	1821.	1831.
England and Wales, .	8,872,980	10,163,876	11,978,875	13,894,569
Scotland, .	1,599,068	1,805,688	2,093,456	2,365,807
Ireland, ..	—	4,500,000	6,802,093	7,734,365
Army and Navy, ..	470,500	640,500	319,300	277,017
Totals.	10,942,548	17,109,864	21,193,724	24,271,758

The increase of population has been greatest in the manufacturing districts, where, in some instances, it has been double of those which are merely agricultural; as, for example, the increase in the manufacturing counties of England, from 1821 to 1831, was 22 per cent., while in the agricultural counties it was only 10½. It has been ascertained, that, in 1831, there were of the classes belonging to the aristocracy in Great Britain, from 3000 to 4000 families; of squires and gentlemen, who are land proprietors, stockholders, money-lenders, &c., from 50,000 to 60,000 families; of learned professions—36,000 clergy of all denominations, about 30,000 lawyers, and 50,000 physicians, surgeons, apothecaries—making 116,000 families, with half as many more dependants; of farming tenants, about 250,000 families, and of their laborers, 400,000 families; of merchants, shop-keepers, and general traders, 900,000 families; of artisans, 200,000 families; of manufacturers in all lines, 500,000 families; of laborers, porters, and servants, 600,000 families; and of destitute paupers, soldiers, &c. 800,000 families.

The statement of the aggregate population of the British islands, affords no idea of the force which is actually employed in agriculture and manufactures. The effective laborers (men) are estimated to amount to no more than 7,000,000, whereas, reckoning the powers exerted in productive industry by animals, mills, steam-engines, and mechanism of various kinds, the force is equal to the strength of more than *sixty millions* of working men.

An estimate was formed a few years ago of the total annual income of all classes of people of the United Kingdom, with the aggregate value of the articles of use and luxury which each produces, and from this we make the following extract:—

Value of agricultural and dairy produce,	£236,600,000
" Mines and minerals,	21,400,000
" Inland and foreign trade,	57,773,059
" Manufactures,	148,050,000
Total of produce and property annually created in Great Britain,	£503,823,059

An estimate was also formed of the value of the whole property, public and private, which has been created and accumulated by the people of this country, and which they now actually possess. This value, when the sum is expressed by figures, is so immense that it eludes the imagination to conceive it.

Value of productive private property,	£2,995,000,000
" unproductive, or dead stock,	580,700,000
" public property of all kinds,	103,800,000
Total public and private property,	£3,679,500,000

The wealth of the empire is distributed in the following proportions between the three countries:—

	Productive private property.	Unproductive priv't prop'ty.	Public property.
England,	£2,054,600,000	£374,300,000	£42,000,000
Scotland,	318,100,000	51,100,000	3,000,000
Ireland,	622,100,000	116,400,000	11,900,000

The proportion which these values bear to the population in each country is not suggested by the table; but in England (taking productive and unproductive property together) the ratio is £186 to each person; in Scotland, £160; and in Ireland, £96.

The following is the latest statement of the extent and population of the empire:—

	Population.	Sq. Miles.
British Islands,	24,271,758	99,948
British dependencies in Europe,	247,701	
North America, Canada, &c.,	1,066,208	1,930,000
West Indies,	884,050	
Australian Colonies,	39,685	1,496,000
Islands of Ceylon and Mauritius,	1,034,736	23,000
British possessions in Africa,	154,046	91,000
East Indian Empire,	89,577,206	826,650
Total,	117,375,390	4,457,598

Since the preceding details were collected, the returns of the census of Great Britain for 1841 have been published. It appears from these, that on the night of the 6th of June 1841, the population was as follows:—

England,	14,995,508
Wales,	911,321
Persons traveling on railways and canals,	4,896
	15,911,725
Scotland,	2,628,957
Man, Jersey, and other islands in British Seas,	124,079
Total of Great Britain,	18,664,761

If to this we add 8,205,382 for Ireland, which, however, we have only on newspaper authority, the total population of the United Kingdom, on the night of June 6, was 26,870,143. The returns included only such part of the army, navy, and merchant seamen, as were at the time of the census within the kingdom on shore.

The increase of the population, as compared with the returns of 1831, is at the rate of 14.5 per cent for England; 13 per cent for Wales; for Scotland, 11.1; for the Islands in the British Seas, 19.6: making the increase for the whole of Great Britain 14 per cent, being less than that of the ten years ending 1831, which was 15 per cent.

The Permanence of the Action of Lime.

I know a plot of ground in this neighborhood, containing 166 acres, which formerly grew little except heath. A good dressing of lime was applied on the top sward, which has more than doubled its value. This was done about 15 years ago, and totally eradicated the heath. The lime to this day appears in full action, as its effects annually testify, from the richness and sweetness of the herbage, the texture of which has been thoroughly changed by the application of the lime. The deep green hue and luxuriant appearance of this land in spring and autumn form a striking contrast with those adjoining, which are still unimproved. The soil is a thin moorish loam in a high climate, resting on the greywacke formation.

[J. Watson, Eng. Ag. Soc. Jour.

THE POTATO MURRAIN.

In all our observation we have never known a period where two subjects engrossed so much of the public attention, and filled so large a space in the public papers, as do the *Potato Disease* and the rail-way mania, at this time, of the public mind and papers of England.

Although this disease may not prevail with us to an extent sufficient to justify the appropriation of much space, where space is so precious, it may be well to keep inquiry alive, as we propose by occasional extracts like the following, from a late London paper, the Agricultural Gazette.

To the Editor of the Cork Constitution:

Sir—I grieve to say that after having closely watched the state of the potato gardens between Bristol and London last Wednesday, I did not see *one single exception to a total failure*—the stalks all decayed and gone. Where it began early, they were as much withered as you would say an undug garden was in the month of January after a hard frost. Where the disease lately commenced, the edges of the leaves and the young side shoots were quite black; and I understand after this appearance takes place, black streaks are seen running *down the stalk*, from which it is believed the poison is conveyed to the tuber. Having witnessed such complete and total failure through a distance of 120 miles, I can readily believe what I have been told, after an anxious inquiry, that the crop is entirely lost in the south of England; and from my son, who arrived here yesterday from Cambridge, I learn that even north of that county the loss is terrific. I have endeavored to learn from scientific men what has been the cause, and should the calamity reach Ireland, what ought to be done. In the University of Cambridge the subject has been well considered, and after the most strict examination, it cannot be discovered whether it has been caused by animalculæ or fungus; but unfortunately, whatever is the cause, the potato, when the disease has made any head, is poisonous: and this has been proved by pigs which were before healthy, having died in a few hours after being fed on them; and I regret to say that I was this day informed by a gentleman in the city, a man in business, and of the highest respectability, that two Irishmen had died from eating this pernicious food. I trust it is not the case, but, from the quarter I heard it, fear there must be some foundation for the report.

I had a good deal of conversation last evening with a very scientific medical gentleman here, and he told me the only way (as far as he had heard, and believed himself) that the poisonous substance in the diseased potato could be accounted for was, that the plant belonged to the Salarium tribe, and as all the berries or fruit of the light shade contained poison to a great degree, that by some unaccountable change the poison was conveyed back to the tuber through those black streaks seen running down the stalk, for in all instances they are observed to begin above, and regularly descend to the root. This having been proved to be the fact, my chief object in addressing you *is to point out the only way considered now to be effectual to stay the plague, which is, the day a field shows the slightest symptom of disease, to mow down the stalks with a scythe quite close.* To potatoes planted early, I am convinced it can be of no injury, as having now ceased to grow, the tubers will ripen in the ground quite as well as if the stalks remained. I should have mentioned that the first part of the potatoes that shows disease is just inside the skin, but that it soon runs through the entire in brown and black stripes. So much has been published within the last week, of the farina not being injured, I need not take up your time on the subject; but my own opinion is, that as far as the disease has penetrated, the farina is gone as well as the other parts.

I have the honor to be, Sir, your obedient serv't,
J. DILLON CROKER.

London, September 13th, 1845.

From the Bristol Mercury, Sept. 20.

The following correspondence has just taken place between Lord Portman, President of the Royal Agricultural Society, and William Herapath, Esq., the eminent analytical chemist of this city, in reference to seed potatoes for 1846. His lordship in a subsequent letter requests that the correspondence may be made public, and it has been handed to us by Mr. Herapath for that purpose. The subject is of vital importance, and is worthy of the deepest attention:

"Bryanston, Sept. 13, 1845.

"Sir—I observe in the newspapers that you have directed your attention to the potato disease, and have advised as to the use of the starch, &c. As I am specially bound, during this year of my holding the office of President of the Royal Agricultural Society of England, to promote inquiry and to notify observations on subjects relative to the produce of the soil, I trouble you with this letter, and ask if any method has occurred to you by which the potato may be preserved for the planting of 1846? I have found that potatoes apparently sound and free from the disease, though in a field or garden which has been partially diseased, have, after being stored away, shown signs of the disease and have rotted off; and I fear that the greatest quantity of the potatoes will thus perish, and so continue the distress of the poor into another season. I have directed some potatoes to be stored in slaked lime, in the hope that it may preserve them, but have, of course, yet had no time to judge of the effect. I therefore ask for your opinion, as one of our most eminent chemists, upon this point, and would ask leave to

make known your reply, if you are able to offer an opinion sufficiently explicit to be useful.

"I remain your obedient servant,

"WM. HERAPATH, Esq." "PORTMAN.

"*To Lord Portman, President of the Agr. Society.*

"BRISTOL, Sept. 17, 1845.

"MY LORD:—In reply to your letter of the 13th inst., I must say that I do not think it would be either safe or prudent to depend upon the infected potatoes of the present season as seed for the next year; as, in all instances, I have found the diseased parts to extend when the potatoes are kept in a damp situation; I should therefore expect that if any diseased seed was kept so dry as not to rot before setting time, yet upon being planted and left in the damp soil, the rotting process would then begin, and the hopes of the husbandman be disappointed. I have no doubt that some potatoes, apparently sound, have (as stated by your lordship) been found to be affected after stowing away; but I do not consider this to have been an origination of it, but merely that which was unnoticed when dug has become apparent after storing. When a potato is first affected, the diseased parts are scarcely visible; but upon keeping it in a dry place, the spots soon become dark, and consequently more apparent, but the spots do not extend; if, however, the tuber has been kept in a damp place, the spots not only extend rapidly over the surface, but penetrate into the interior, and in a short time it will be completely rotten. As far as the slaked lime, which you have used in your potato stores, has a tendency to prevent the tubers from touching each other, or, by its power of absorbing water, of keeping them dry, it will answer a good end: but it must not be expected to have any chemical effect upon the diseased parts or their juices. Anything which, like dry saw-dust or sand, would prevent contact, would prevent the propagation from one tuber to another; and any substance capable of absorbing the moisture of the air in which the potato is stored, would prevent the extension of the disease in each diseased root. Our best microscopists and cryptogamists are divided in opinion as to whether the cause of the calamity is a fungus or not. After all the examination I have given to the subject, and a careful review of all the evidence brought before me on the two sides, I believe that it is; and I am daily confirmed in the opinion originally expressed, that the only advantageous way of treating the diseased potatoes is to obtain from them, by rasping and washing, the starch which they contain—by which process all their nutriment can be retained; and if it is well dried it will keep for any length of time. The operations can be performed in the cottage or manufactory alike, as no apparatus beyond a tin rasp (a nutmeg grater,) a tub, and clean water are required; and I have ascertained that however far the disease might have extended, even if the root is rotten, yet the starch can be separated, and in a state fit to be eaten, if it shall be well washed, as all the bad parts come away with the water, while the great weight of the starch carries it to the bottom of the vessel. If it is required that the fecula should have all the qualities of the best foreign arrow-root, it is only necessary to wash it last in water containing a little chlorine, when it has unrivaled color and quality, and this I can speak of practically, having made many tons of the article. I will only add, that an opinion has been circulated that the disease is owing to the introduction of guano as a manure; this I feel no hesitation in contradicting, as I have seen it in situations where no guano has been used, and where every other variety of manure has been resorted to.

"I am your lordship's most obedient servant,

"WILLIAM HERAPATH."

The Governor of the Province of North Holland and the agricultural committee of Groningen have just published official reports respecting the murrain amongst the potatoes. In the circular of the above functionary, it is stated that potatoes when they begin to be inflamed and are only slightly infected, should be carefully spread out, and dried in a dark place; this (it is said) will harden the germ of the disease, and arrest its progress. It is recommended not to throw away the potatoes which are more deeply injured, but to extract the nutritious portions from them. The inhabitants of North Holland are also recommended by the governor to try to raise winter potatoes in gardens and on sandy soils, to plant them a foot deep in September or October, and to cover the ground with straw or leaves as soon as the frosty weather sets in. The official report of the Groningen Agricultural Committee is a much more lengthy and important one, and enters at once into the causes and character of the disease, and proposes some remedies. The malady is partly ascribed in the report, to the heavy rains of the summer of 1844, and to the wet weather which prevailed just at the time the tubercle seeds were formed, and partly to the carelessness of the agriculturists in keeping the potatoes intended for planting perfectly dry. It is thought too that the excessive cold of last March proved very injurious. The more direct causes are thus enumerated:—1. The too rapid growth of the plants this year. 2. The excessive heat which prevailed in the first part of the summer of the present year, being, on the 13th of June, 87 deg. of Fahrenheit; on the 3d of July, 87½ deg.; and on the 7th of the same month 91½ deg. On these days several persons fell dead in the fields. 3: The rain which fell at intervals, and which subjected the plants, as it were, to the action of warm water. 4. The cold and moist temperature which succeeded, from the 15th of July to the end of August: and, 5, the existence in several places, on July 21 and 22, of an extraordinary fog, which emitted a disagreeable odor. The agricultural committee attach much importance to this miasma; for they hasten to state that the malady almost immediately afterwards was manifested, and they add that they are not by any means disposed to place this fog amongst the improbable causes *(onw aarschijnlijkheden)* of the complaint in question. In the province of Groningen it was clearly ascertained that the infection proceeded from the leaves and the stalk to the root, and that it was displayed by small stains and by the existence of a species of mushroom placed by some writers under the head, *plusiporum solani*. No traces of these parasites were discovered in the stalks or the tubercles—a fact which is set forth as a proof that the disease was first propagated from the leaves, and consequently that it differs essentially from those murrains which originate in the roots. "We maintain," observe the committee, "that this disease has probably existed before, more or less, but that it is one which hitherto has not been described by naturalists *(maar eene bijde nat unrkundigen nog onbeschrevene ziekte)*.

To prevent the return of the disease the following remedies are suggested:—Leave the potatoes in the ground until the weather becomes very dry, and then spread them out in the field. Be very careful not to plant potatoes infected with the disease. Keep those intended for sowing very dry, and give the preference to potatoes produced on sandy soils. Burn at once the rotten potatoes. Avoid as much as possible planting potatoes in places where they grew this year, and which ought, moreover, to be well covered with lime as soon as the crop is removed.

P. S. We have recently learned from a gentleman residing near South Amboy, and whose crop of potatoes was remarkably fine in size and appearance, that they are already rotting in his cellar; and such is said to be the case with potatoes shipped from the State of Maine to southern ports.

"It's an ill wind that blows nobody any good," but it would be a curious fact if the failure of the potato crop in Ireland, on which from three to four-fifths of the population subsist, should save us from the dire and unforeseen calamities of *war*. It may be that the dread of famine may tame the arrogance, or soothe the justly offended pride of Great Britain, and induce her to surrender quietly what does not belong to her; or, contrary to her practice and character, to submit to be wronged and plundered, *as the case may be*.

IMPORTANT AND EXTENSIVE SALES OF SHORT-HORNS.—At Mr. Henry Watson's sale, at Walkeringham, 18 cows, heifers, and bulls, out of his lots, sold for £1815 8s., and Barmpton Rore, lot 4, sold with her family, *ten* in all including *herself*, for £103 11s., or averaging £103 3s. 1d. ($500) each; Barmpton Rore was purchased by Mr. Watson from Mr. Wetherell, she having Princess Royal at her foot, and being in calf at the same time with Butter-cup. The herd of Mr. Watson were principally descended from the following first-class bulls, viz., Comet, 155; Cossack, 1880; Raree Show, 4874; Belshazzar, 1703; Rathriagh, 6366; Bellerophon; 3119; and Lord Adolphus Fairfax, 4249. The neighbors of Mr. Watson, feeling gratified with the renown brought upon their village by the successful exertions of that gent. as a breeder of stock, which was proved by the commanding prices they obtained, honored him, at the close of the sale, with a merry peal on the church bells. [English Paper.

CONSUMPTION OF SUGAR IN EUROPE AND NORTH-AMERICA.

WE feel ourselves not only justified, but called upon, to give place to the following, for the attraction it may have for our numerous and liberal patrons in Lonisiana.

We may felicitate ourselves in having offered them, in Judge Rost's Address, an article so acceptable and well adapted to their interests and industry, that it has been transferred to the New-Orleans Bulletin, and met with a most favorable reception.

From the London Economist.

The following interesting calculation of the entire consumption of Sugar in Europe, the U. States, and the British Colonies, has been made by Mr. Frederick Scheer, after extensive and careful inquiries, for which his extensive connections with the Sugar trade throughout Europe afford him peculiar facilities:

CONSUMPTION OF SUGAR.

Having attempted to ascertain the actual consumption, as well as the entire production, of the important article of Sugar, I now submit to my friends the result of my inquiries. Extreme accuracy can, of course, hardly be expected, but I have no reason to apprehend that I have committed any material error. For corrections, accompanied by official returns or authentic proofs, I shall feel greatly obliged.

It will be seen that the average consumption of the 278 millions of civilized people, which my inquiry embraces, is about 6 2-5 pounds per head per annum, or at the rate prevailing in the custom house union.

The following table is curious, and may lead to some useful conclusions:

							Tons.
If the general consumption of Sugar were equal to that prevailing in Russia,	or	1 6-10	lbs.	per head,	it would	amount to	198,000
Austria,	or	2 6-10	"	"	"	"	324,600
France,	or	8 2-10	"	"	"	"	1,017,000
Holland, Belgium, &c.	or	12 1-10	"	"	"	"	1,501,000
United States,	or	18	"	"	"	"	2,233,000
Great Britain,	or	19	"	"	"	"	2,357,000
If the consumption were equal to what is allowed to paupers in English workhouses, according to McCulloch, 34 lbs. per annum, it would amount to.....							4,219,000
—To what is allowed to sailors in the British Navy, 2 oz. per day, would amount to.....							5,662,000
—To what is probably used among the middling classes in England, viz. 1 lb. per individual in the week, would amount to.....							6 453,000

There can be no doubt that, with a general reduction of duties, the use of this article might be enormously increased; and since it is certain that the greater the demand, the cheaper will commodities be supplied, such increase would open an unbounded field for enterprise, com-

merce, and colonization. It is to be hoped that Governments will take this into consideration, and relieve the article from the heavy burthens and restrictions under which it now labors almost in every country. Thus, sources for industry and enjoyment might be opened to the enormous mass of people enumerated by me, to an extent exceeding almost the flights of the most sanguine imagination.

ESTIMATED CONSUMPTION OF SUGAR IN 1845.

Countries.	*Population according to best authorities.*		*Quantity of Sugar.*		*Quantity per head.* lbs.	10ths
Custom-House Union	29,006,000	Colonial	70,000	80,500	6	2
		Beet-root	10,500			
Belgium	4,214,000					
Holland	3,160,000					
Oldenburg	276,000					
Hamburg	166,000					
Bremen	72,000					
Lubec	47,000					
Hanover	1,808,000					
Mecklenberg	606,000					
	10,349,000	Colonial	51,000	56,000	12	1
		Beet	5,000			
Russia	56,778,000	Colonial	37,000	44,000	1	6
		Beet	7,000			
Austria	38,797,000					
Naples and Sicily	8,320,000					
Sardinia	4,882,000					
Tuscany	1,565,000					
Rome	2,977,000					
Parma	495,000					
Lucca	170,000					
San Marino	76,000					
Modena	378,000					
	57,060,000	Colonial	62,400	68,400	2	6
		Beet	6,000			
France	35,400,000	French colonies	89,000	128,000	8	2
		Foreign	11,000			
		Beet root	28,000			
Portugal	3,412,000			10,000	6	6
Spain	13,786,000	(from Cuba, 1844, 36,100)		36,000	5	8
Sweden	3,111,000					
Denmark	2,248,000					
Norway	1,150,000					
	6,509,000			12,000	4	1
Great Britain and Ireland	28,323,000			240,000	19	0
Ionian Islands	205,000					
Malta and Gibraltar	130,000					
	335,000					
Cracow	145,000	*				
Switzerland	2,316,000					
Turkey	10,000,000					
Greece	770,000					
	10,770,000			4,000		
Canada and other colonies	4,544,000	These and shipping stores, est'd		15,000		
United States	18,700,000			150,000	13	0
Number of people	278,033,000			845,900 tons.		

* Consumption not to be ascertained, but mostly included in the quantities assumed to be used elsewhere.

WEEDS ON GRAVEL WALKS.—A subscriber says: "Seeing in your columns receipts for eradicating weeds on gravel-walks, and thinking 'prevention better than cure,' I beg to mention a plan which I have always found to answer. It is simply, when forming your gravel-walks, and before laying on the gravel, to spread a layer of the dark-colored soap waste, which may be got from any soapery, if in the neighborhood, and then putting the gravel on it and rolling both of them, after spreading, as as firmly as possible. This will not only prevent weeds from growing, but will form a walk as hard and solid as cement. [English Paper.

☞ In consequence of the unwholesome state of the potatoes, the guardians of the Totnes Union have ordered the substitution of bread and rice in the workhouse for the present, at the rate of six ounces of bread, or four ounces of rice (uncooked,) for one pound of potatoes. [English Paper.

☞ A sow, belonging to Mr. John Birchley, of the Red Lion Inn, near Chorley, has produced 63 pigs in four farrows. The mother of this prolific animal had 113 pigs in seven farrows. [English Paper.

WAGES AND CONDITION OF WOMEN AND CHILDREN, EMPLOYED IN AGRICULTURAL LABOR, IN ENGLAND.

EFFECT OF THAT CONDITION AND DESCRIPTION OF LABOR ON THEIR HEALTH AND MORALS.

If any man desires to have a view of materials that will enable him to form a judgment on the matters which we have grouped as a heading for this paper, let him get and read the "Reports of Special Assistant Poor Law Commissioners on the Employment of Women and Children in Agriculture, presented to both Houses of Parliament, by command of Her Majesty," and printed in London in 1843.

In presenting the extracts, made pretty much at random, we do not see that they call for any particular comment from us. Every reader will make his own reflections, and on certain points all must arrive at the same conclusion—to wit: that Agricultural labor in the field, is in general more favorable to the morals, and more conducive to the health of women and children than labor in-doors—either domestic or manufacturing; and that the condition of women, *white women* and children, generally, in England, on the score of number of hours daily, and severity of labor is not better; and in respect of clothing, personal cleanliness, diet and shelter, and morals, is infinitely worse than that of the slaves of this country. On this point the book before us is so minute, particular, authentic and official; prepared with care, and based on the testimony of enlightened and disinterested witnesses, and presenting these points in every aspect in which it is possible to view them, that no shadow of ground is left for doubt or caviling. The testimony was taken under oath, and under instructions, which informed the Commissioners that the subject of their inquiry was the *Employment of Women and Children in Agriculture.* They were requested to examine into the sorts of labor at which they are respectively employed, the wages which they receive, the hours of work, and any other similar facts which "may tend to throw light on their physical and moral condition." The Commissioners desired the Assistant Commissioners, who consisted of four barristers-at law, to direct their main attention to the employment of children, and that they would particularly inquire into the age at which they begin to work, and to the effects which their occupation in labor may produce upon their bodily health as well as upon their opportunities for obtaining school instruction and moral and religious education.

As we have before stated, the few extracts for which we can find room, will be taken much at random, but in a way to throw light on the several points of inquiry. The whole volume of nearly four hundred pages goes to show that the condition of the English laborer and his family is most deplorable. No man of humanity but must be shocked at the view of it; and the perusal of this testimony, not from the laboring men and women only, but from physicians and clergymen confirms us in the impression we have long entertained, that the agreeable emotions which must attend the traveler on a view of a country presenting such a magnificent landscape of palaces and perfect culture, and the admiration which must be begotten by the grandeur of their lordly domains, must be painfully counteracted by the evidence of extreme suffering and degradation which every where shocks his sensibilities. A gentleman lately returned from England, who had enjoyed the easy and elegant hospitality of English Noblemen of the highest character, observed, that while no country life on the Globe could compare with it in respect of the perfection of all the domestic appointments for social enjoyment among men of rank and opulence; it was yet absolutely painful to him, in going over their estates to witness the signs of abject cap-in-hand servility which characterized their laborers, and even of the employés and agents of some authority over them.

Heaven bear us witness, we have no pleasure in making such exposures of the wretchedness of our fellow creatures, but knowing as we do, from long personal observation, the unaffected kindness of those in the South, who are born inheritors of slaves, we deem it fair to afford them the encouragement and consolation to know that when those whom Providence has placed in their possession, are not treated with cruelty which deservedly disgraces the perpetrator, their situation is a paradise compared with the half-starved populace of foreign countries called free. We say where they are not treated with cruelty, for *that* we would denounce, and have punished by the laws, when power is so abused even towards dumb beasts.

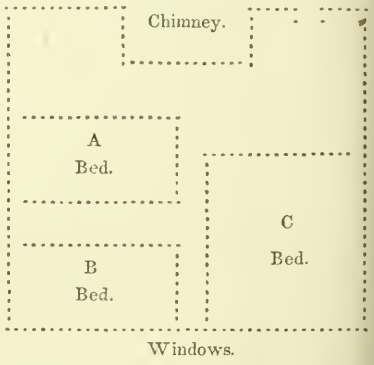
The extracts which follow make part of the Report of one of the Commissioners, Mr. Austin, on the Counties of Wilts, *Dorset*, Devon and *Somerset*, on the point of inquiry relating to

lodging, and contain also the evidence of three women as consecutively arranged in the book.

To understand these accounts it is necessary to bear in mind that these families *find themselves out of the wages mentioned*; and that for calculation, it is near enough to reckon a pound at five dollars, a shilling at twenty-five cents, and a penny at two cents. As to lodging and food it would be curious to run the comparison between that which the white laborers of England obtain, as here stated, in "*Dorset and Somerset*," and that which is the lot of slaves in "*Dorset and Somerset*," *Maryland*. Here every black family has a good tight house, made of logs, filled in with billets of wood and clay, a dry clay floor, which they prefer to one of plank, and a shingle roof; abundance of wood, with, generally their own garden, as much as they choose to work; and their hog, besides their regular allowance of meat, generally three, sometimes four pounds each, and their poultry to raise for sale; with their "patch" of unlimited size for sweet potatoes and cabbages. Besides these they have the offal of the garden, the dairy, and the orchard for the children, with some old woman to take care of them; a physician quickly in attendance in case of sickness, and the good house-wife to see that they get tea and sugar, and soup, and other suitable diet in all cases of need.

There is not a man who has had an opportunity of observation that does not know this to be a true picture. We give it as a mere *presentment of facts* for the information of a natural curiosity as to the comparative condition of laboring classes in different countries. Facts which, like every other sort of knowledge, men of any *ism* may well desire to possess.

"With regard to lodging, there is no difference between that of the women who labor in the fields and the women of the same class who do not. The want of sufficient accommodation seems universal. Cottages generally have only two bedrooms (with very rare exceptions); a great many have only one. The consequence is, that it is very often extremely difficult, if not impossible, to divide a family so that grown-up persons of different sexes, brothers and sisters, fathers and daughters, do not sleep in the same room. Three or four persons not unfrequently sleep in the same bed. In a few instances I found that two families, neighbors, arranged so that the females of both families slept together in one cottage and the males in the other; but such an arrangement is very rare, and in the generality of cottages I believe that the only attempt that is or that can be made to separate beds, with occupants of different sexes, and necessarily placed close together from the smallness of the rooms, is an old shawl or some article of dress suspended as a curtain between them. At Stourpain, a village near Blandford, I measured a bed-room in a cottage consisting of two rooms, the bed-room in question up stairs, and a room on the ground-floor in which the family lived during the day. There were eleven in the family: and the aggregate earnings in money were 16s. 6d. weekly (Dec. 1842), with certain advantages, the principal being the father's title to a grist of a bushel of corn a week, at 1s. below the market price, his fuel carted for him, &c.—They had also an allotment of a quarter of an acre, for which they paid a rent of 7s. 7d. a year. The following diagram shows the shape of the room and the position of the three beds, A, B, C, it contained. The room was ten feet square, not reckoning the two small recesses by the sides of the chimney, about 18 inches deep.—The roof was the thatch, the middle of the chamber being about seven feet high. Opposite the fire-place was a small window, about 15 inches square, the only one to the room.



Bed A was occupied by the father and mother, a little boy, Jeremiah, aged 1½ years, and an infant aged 4 months.

Bed B was occupied by three daughters,—the two eldest, Sarah and Elizabeth, twins, aged 20; and Mary, aged 7.

Bed C was occupied by the four sons,—Silas, aged 17; John, aged 15; James, aged 14; and Elias, aged 10.

There was no curtain, or any kind of separation between the beds.

This I was told was not an extraordinary case; but that, more or less every bed-room in the village was crowded with inmates of both sexes, of various ages, and that such a state of things was caused by the want of cottages.

It is impossible not to be struck, in visiting the dwellings of the agricultural laborers, with the general want of new cottages, notwithstanding the universal increase of population. Everywhere the cottages are old, and frequently in a state of decay, and are, consequently, ill adapted for their increased number of inmates of late years. The floor of the room in which the family live during the day is always of stone in these counties, and wet or damp through the winter months, being frequently lower than the soil outside. The situation of the cottage is often extremely bad, no attention having been paid at the time of its building to facilities for draining. Cottages are frequently erected on a dead level, so that water cannot escape; and sometimes on spots lower than the surrounding ground. In the village of Stourpain, in Dorsetshire, there is a row of several laborers' cottages, mostly joining each other, and fronting the street, in the middle of which is an open

gutter. There are two or three narrow passages leading from the street, between the houses, to the back of them. Behind the cottages the ground rises rather abruptly; and about three yards up the elevation are placed the pig-sties and privies of the cottages. There are also shallow excavations, the receptacles apparently of all the dirt of the families. The matter constantly escaping from the pig-sties, privies, &c. is allowed to find its way through the passages between the cottages into the gutter in the street, so that the cottages are nearly surrounded by streams of filth. It was in these cottages that a malignant typhus broke out about two years ago, which afterwards spread through the village. The bed-room I have above described is in one of them.

This is, perhaps, an extreme case; but I hardly visited a cottage where there were any attempts at draining. The dirt of the family is thrown down before or behind the cottage; if there is any natural inclination in the ground from the cottage, it escapes; if not, it remains till evaporated. Most cottages have pig-sties joining them; and these add to the external uncleanliness of the laborers' dwelling.

With reference to the subject of lodging, Mr. Phelps, an agent of the Marquis of Lansdowne, says:

"I was engaged in taking the late census in Bremhill parish, and in one case in Studley I found twenty-nine people living under one roof; among them were married men and women, and young people of nearly all ages. In Studley it is not at all uncommon for a whole family to sleep in the same room. The number of bastards in that place is very great; the number of unmarried women is greater than that in the neighboring places. I don't think this state of things is attributable to the women working in the fields, but more to the want of proper accommodation in the cottages."

Hon. and Rev. S. Godolphin Osborne, rector of Bryanston, near Blandford, in Dorsetshire, says:

"To say nothing of the physical injury done to himself (the laborer) and family from the want, in most instances, of anything like proper drainage without his dwelling, and the foul air which they are compelled to breathe from the too confined space of the dwelling within, from infancy to puberty his children for the most part sleep in the same room with his wife and himself; and whatever attempts at decency may be made, (and I have seen many most ingenious and praiseworthy attempts,) still there is the fact of the old and young, married and unmarried, of both sexes, all herded together in one and the same sleeping apartment. Within this last year I saw, in a room about 13 feet square, three beds: on the first lay the mother, a widow, dying of consumption; on the second two unmarried daughters, one 18 years of age, the other 12; on the third a young married couple, whom I myself had married two days before. A married woman of thorough good character told me, a few weeks ago, that on her confinement, so crowded with children is her one room, they are obliged to put her on the floor in the middle of the room, that they may pay her the requisite attention: she spoke of this as to her the most painful part of that her hour of trial. I do not choose to put on paper the disgusting scenes that I have known to occur from this promiscuous crowding of the sexes together. Seeing, however, to what the mind of the young female is exposed from her very childhood, I have long ceased to wonder at the otherwise seeming precocious licentiousness of conversation which may be heard in every field where many of the young are at work together. Early robbed by circumstances of much of that purity which is her honor's safest guard, field-work lends a finish to the mischief."

Mr. Spooner, of Blandford, surgeon, says:

"Generally the cottages are too small for the families living in them, and tend to produce and aggravate disease, from the inmates living so closely together. Two years ago typhus fever occurred in a neighboring parish, which I attend; there was one cottage I attended which consisted of one room on the ground-floor, and two small bed-rooms up stairs. In this cottage lived an old man, with his wife, his two daughters, middle-aged women, and his son and wife, with three children—in all, ten individuals.—The whole family had the fever, some of them very severely. The son's wife, with two of her children, were on a bed in an out-house; in the out-house was a well, and a large tub containing pigs' victuals, and was the general receptacle for everything. The floor was earthen, with no ceiling but the thatch of the roof. In the same village there were more than forty cases of typhus, and the spread of the disease must be attributed to the people living so densely packed together."

The clothing of women employed in field-labor would appear to be inadequate for their work, but the deficiency is not complained of by them. A change of clothes seems to be out of the question, although necessary not only for cleanliness, but for convenience and saving of time. The upper parts of the under-clothes of women at work, even their stays, quickly become wet through with perspiration, whilst the lower parts cannot escape getting equally wet in nearly every kind of work they are engaged in, except in the driest weather. It not unfrequently happens that a woman, on returning home from work, is obliged to go to bed for an hour or two to allow her clothes to be dried. It is also by no means uncommon for her, if she does not do this, to put them on again the next morning nearly as wet as when she took them off. It does not appear that any ill consequences to the health have been observed by medical men to arise from this cause, unless rheumatism be partly attributable to it. The want of a change of working-clothes, however, does not prevent the generality of working women having a better gown and other articles of dress for Sundays or holidays.

With reference to the question of clothing and linen for the family generally, a great change has been effected for the benefit of the laboring classes within these few years by the clothing clubs, which are excellently contrived for aiding the poor, and at the same time making such assistance depend upon their own exertions and good conduct, and for avoiding all the mischiefs of indiscriminate charity. I had an opportunity of examining the clothing club at Blandford, in Dorsetshire, and its arrangements and working appeared equally excellent. Any laboring family of good conduct was allowed to belong to it, subscribing 1d. 2d. or 3d. a week, according to its size and other circumstances. At the end of the year, Christmas, these subscriptions are doubled by the donations of persons in a better position of life, living in the neighborhood. The subscribers are then entitled to purchase of the tradesman appointed to supply the club, to the amount of their respective shares of the funds, any plain articles of dress or of household linen. The tradesman of the club, in consideration of the large sum of money thus laid out, and promptly paid at his shop, which in the Blandford club exceeded £2,000 last Christmas, supplies the best articles of the description wanted at a price rather lower than he could afford to sell them to the laborer dealing with him in the ordinary way. It is also an imperative rule of

the club, that, if any subscriber purchases with club-money any article of dress or linen not of a plain and useful description, he ceases to be a member, as he also does upon any ill conduct. The effect of these clubs has been very great in increasing the linen and clothes of the laborers' families since their establishment.

The general conclusion as to the physical condition of women engaged in Agriculture is, that it is better generally than those of the same class not so employed. The reason is evident: the means of the family are increased by her earnings; she has more food, if she be not better clothed and lodged. Her health is also better. I am now speaking of her own physical condition; the effects of her working at farm-labor upon her domestic economy, her husband and children, will be considered presently."

Mrs. Bustle, wife of Charles Bustle, farm-laborer, Whitchurch, Dorset, examined.

My husband is carter to Mr. Fowler. He has 7s. a week wages. We have also our cottage, with a garden, and ten lugs* of potato-ground, rent free; also a bushel of grist corn, if we like as much, a week—that is, tailings at 5s. per bushel. Every week or ten days my husband goes a journey with the wagon—he has then 1s. for his dinner, and another shilling which he may spend at the public house where he puts up; which he always does, however. If he carries his victuals with him, he has still 2s. every journey. He is out a day and night generally on a journey. Mr. Fowler also gives us furze for firing, and my husband has £1 at harvest, because he can't do tut-work like the others—he is wanted for something else. I have five girls and a boy. The three eldest girls, 8, 10, and 12, do buttoning, but I don't think they earn 2s. a week between them; they spoil a good deal of cotton, and dirty more; and they don't get all money for their buttons—it would be better if they did. The boy is too young to work.

The bread we make at home is better than baker's bread; I make six loaves out of a bushel of corn: we have not quite so much as that every week; but what we have, with a bag of potatoes, (240 lbs.) is quite as much as we consume at home. Four baker's loaves, with the potatoes, are not enough.—Baker's bread does not satisfy the children; it is licked away in no time, and they are hungry all day long with it. We never know the taste of butcher's meat, except when a piece is given to us.

Susan Vacher, widow, Milton Abbas, Dorset.

Women are employed in the hay-harvest, and at other times of the year in couching, weeding, and keeping the land clean. Generally the regular hours are from eight to five, but at hay-time and harvest longer; it depends on circumstances. In harvest I have earned 1s. a day, and have had two quarts. For hay-making I have had 8d. a day, but it depends on the weather. At other times, for couching, &c. 7d. a day. For drawing reeds I have had 7d. a day.—Wages for women have always been pretty much the same.

I am now in my fifty-seventh year, and have worked two-and-twenty years in the fields; I am always better when out at work, and prefer it to living at home. I have nine children. I have two grown-up sons—one 39, the other 27. They went out to work when they were boys—one at 7 years old, the other at 9. They were always quite healthy and strong. As for young women, I think it better for them to go into the fields; they are quite as well there as at buttoning, as far as their morals are concerned. Boys do n't want to bide at home when they have once been out. My eldest son now [Dec.] gets 7s. a week and a grist; he also gets his cottage for 21s. a year, and has a garden and ten lugs of potato-ground free. He is not married. He keeps a pig. *Most laborers manage to keep some of the pig when they kill it—nearly always half of it.* I know where the whole is kept. The farm-laborers generally manage to have a little bacon by them, and they do n't always go without cheese. The cottages at Milton Abbas are not nearly so full as I have known them.

Rachel Hayward, wife of John Hayward, farm-laborer, Stourpain, Dorset.

There are eleven of us in our family—myself, my husband, three daughters, and six sons. We have two rooms—one down stairs, and the other up stairs over it. We all sleep in the bed-room.

My husband gets 8s. or 7s. with a grist, a bushel, a week; my two eldest daughters get about 3s. 6d. a week at buttoning, and three of my boys get 5s. a week together—in all about 16s. 6d. a week. We have 16½ lugs of potato-ground, on which we grow potatoes and a few vegetables: for that we pay 7s. 7d. a year rent. We pay 1s. a week for the cottage, and coal and wood cost us 1s. 8d. a week at this time of the year, [Dec.] We get ¾ cwt. of coal a week. I buy, besides, every week, ¾ lb. soap, 1 oz. tea, ½ lb. bacon. I reckon we eat a pound of bread each day; that, with potatoes, gives us enough. My three boys that are out at work went out at 9 years old.

* *Lug*, in Ireland, and in some parts of England and Scotland, is a synonym for *ear*. This is probably the root of the term as applied to land, meaning a perch or pole. Thus we have, in Spencer, a reference made to "eight lugs of ground." [*Ed. Farm. Lib.*

GAS-WATER AS A MANURE.

To the Editor of the Mark-Lane Express:

An "Old Subscriber," if he wishes to employ the refuse of gas-works for manure, must proceed in his early practicings with extreme caution. The *gas-water*, or ammoniacal liquor, is undoubtedly an excellent manure, but it requires much diluting to fit it for a liquid manure. If it be applied as received from the gas-works to grass, it will apparently burn up and destroy the plant, but the next year the spot will be distinguished by very much increased fertility; the *refuse lime* through which the coal-gas has been passed in the process of purifying it from the sulphureted hydrogen becomes impregnated with the sulphureted hydrogen, and is partly converted into hydro-sulphuret of lime; a portion of ammonia is at first also in combination with it, but the carbonic acid gas of the lime combining with the ammonia, converts it into carbonate of ammonia or the volatile alkali; and in a very short time, from exposure, no ammonia will be found remaining in the refuse lime. Refuse lime may be applied either direct to the land or in compost, and in addition to its property as a manure, it is considered very offensive and destructive to many insects and grubs. *Gas-tar* contains the elements necessary for constituting a good manure, but has hitherto been but little used as a fertilizer. Mr. Bowley directs the compost heap to be formed with long dung about three feet deep, and coal-tar to be poured regularly over it, upon which another layer of dung or turf is to be put, and over all, on the top, is to be spread the lime; the whole is to remain in this state for two or three months before it is turned.

If the lime be placed under the tar, the tar will find its way through the dung to the lime, and, uniting with it, will form a hard cement, which will be broken with difficulty, and which he supposes will be but of little service to the land. I am, Mr. Editor, yours, &c.

AN OLD FRIEND.

THE COTTON PLANT....ITS HISTORY AND USES.

(Concluded from page 223.)

In 1840, at their instance, eight specimens of the soils of Edisto Island were analyzed by Professor Shepard.* The report of the Committee to whom was referred the valuable communication of that skillful chemist, is replete with highly useful matter, especially in relation to manures.† Full information on the other subject may shortly be expected from a very intelligent quarter. At the Agricultural Convention held at Monticello, Fairfield, on the 5th of July last, it was resolved "to request the Agricultural Societies of the State to unite in a contribution to procure a perfect analysis of the long and short staple Cotton stalk, seed, and lint, in the perfect state, and also when affected by disease." When this is done, a great object will have been attained. The planter, aided by the knowledge on other points equally important to be acquired, will no longer tread the path of doubt and uncertainty. The materials for restoring the constitution of the soil, and imparting health and vigor to the Cotton plant, have long been in his possession, but for the first time he will then know how to use them, and where necessary, how, and in what proportions, to unite them.

The Sea-Island Cotton fibre was analyzed in England, in 1825, by one well qualified for the task. 100 parts of the ashes, says Dr. Ure, yielded as follows:

1. Matter soluble in water, sixty-four parts, consisting of	
Carbonate of potash	44.8
Muriate of potash	9.9
Sulphate of potash	9.3
2. Matter insoluble in water,	
Phosphate of lime	9.0
Carbonate of lime	10.6
Phosphate of magnesia	8.4
Peroxide of iron	3.0
Alumina a trace, and loss	5.0
	100.0

"These results," remarks the analyzer, "seem to throw considerable light on the predilection of the Cotton plant for the neighborhood of the sea, which supplies plentifully the saline substances requisite to the perfect development and constitution of its woolly fruit. It may hence be inferred, that the compost or manure best fitted for Cotton plantations should contain neutro-saline matter with alkaline, calcareous, and magnesian bases. The presence of magnesia deserves notice, as it indicates marine food."

The subject of a rotation of crops is of recent interest. It was of course unmooted by the first cultivators of our great staple. In Georgia, a few planters have of late grown Cotton on every alternate ridge with corn occupying the intermediate ones. When the field is again planted, the Cotton rows are substituted for the corn rows, and those of the latter for the former. This plan might be pursued with benefit, except on the sea-board, where the high light lands, which are limited in quantity, and unfit for corn, are alone considered safe for Cotton. In a small way, potatoes,* rest,† and Cotton, or *spring* peas,‡ as a crop in lieu of potatoes, designedly cultivated for the offal, rather than the product, is a good rotation. On this subject there are two theories:—1st. That while the continuous cultivation of any one crop deprives the soil of the specific aliment essential to its fructification, another plant, requiring some other food, may be advantageously substituted. 2d. The celebrated chemist, De Candolle, says, "Of the nutriment which vegetables receive and digest, they exude an inconsumable or innutritive portion by their roots. This excrementitious matter is supposed to unfit or poison the soil for a second crop of the same kind, until it is either consumed or neutralized by cultivation." May not this be the true reason why it is so difficult to get a good stand on land planted for three or more consecutive years. As soon as the plants recover from their sickly state, and this takes place when the poisonous substance discharged from their roots is destroyed by tillage, the crop grows as vigorously, and the product is usually as good as rested grounds, where the same amount and kind of artificial nourishment have been applied. M. Olivier, member of the Institute of France, in describing the insects which devour the upper part of the roots of farinaceous plants, and which multiply to infinity, where the same soil presents to them, for years in succession, plants of the same or of similar kinds, says, "*these insects perish* as often as vegetables are cultivated which cannot serve for food for their larvæ." Edmund Ruffin, in the Farmer's Register, advances a similar postulate—"Every plant," he remarks, "is subject to be preyed on by its own peculiar tribes of insects, which are continued to be supplied by their proper food, and favored by the still continuing circumstances of the field, and, therefore, are increased continually in numbers, and in their destructive ravages, as long as the crop which fed them, and the circumstances which favored them, remain unchanged; and that these insects must be destroyed or greatly reduced in their numbers and power of mischief, by a total change of the growth, and of the treatment and condition of the field.§ These opinions, from high authorities, are well entitled to the attentive consideration of our planters. As the alternating system in relation to the successful culture of other crops is admitted to be necessary, its applicability to the Cotton husbandry cannot reasonably be doubted.

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* See note C in the Appendix.—Southern Cabinet, vol. i. p. 405.

† Southern Cabinet, vol. i. p. 449.

* Allowing one year to intervene, Cotton is always advantageously grown on potato land, which, if assisted by salt mud, the benefit to the crop will be still more of a decided character.

† Ungrazed.

‡ The summer crop keeps the ground bare of vegetable matter. The other is succeeded by a heavy yield of crop grass.

§ Farmer's Register, vol. vii. p. 609.

As slovenly as was originally the tillage of the Cotton plant, the preparation of its produce for market was much more so. It was indeed so badly cleaned, as to be deemed suitable only to the coarser fabrics.* Up to about the year 1820, the gatherers took no especial pains to abstract the decayed leaves. The wool was sunned all day, and ginned frequently with the stained particles incorporated with it. These were removed in the process of moting, which was effected by women sitting on the floor where it was beaten with twigs. During the operation of ginning, no bags or boxes received the Cotton, and oftentimes large quantities were thrown together until the moters were prepared to examine them. In packing, an old iron axle-tree, or wooden pestle, the present instrument, was used. There were no reinspectors of the cotton before it was deposited in the bag, in which the spinner would frequently find, in addition to a large supply of leaves and crushed seeds, potato skins, parts of old garments, and occasionally a jack-knife. With many, the Cotton was ginned, moted, and packed in the same room. Very different indeed are the present processes, or rather the modes in which they are severally performed. Separate rooms for the seed and ginned Cottons, as well as for the wool, which, after it is gathered, is never exposed to the sun, have long been considered necessary in the sea-board parishes to ensure the proper after-handling of the crop. There are required a room for the whipper, if one be employed, which extracts the dirt and imperfect filaments; another for the assorters, who, provided with boxes for their clean Cotton, perform their work before a long table, covered with wire, or wooden slats, the $\frac{1}{8}$ of an inch apart; a third for the moters, who also stand before a latticed table, and as often as a handful of Cotton is prepared, it is thrown into a wooden box, about three feet from the floor, and secured to the sides of the building immediately behind the moters respectively; a small room for the moted Cotton, and one for the packer, usually adjoining it; and a house or room, proportioned to the force employed, for the ginners, in which are boxes for the seed Cotton in the rear of the operators, and boxes under the machines for the ginned Cotton. The houses are lined on the inside with planed boards, and the windows of the assorting and moting rooms, and the gin-house, are glazed. All these accommodations are now to be found on nearly every plantation on the Sea-Islands and the adjacent country, and, it is said, in many of the upper Parishes.

The amount of labor expended in a day in preparing one bag of superfine Cotton of 300 lbs. weight, the produce of 1,500 lbs. in the seed, is as follows, viz:

Drier	1
Turner and feeder of the whipper	2
Assorters, 50 lbs. each	30
Ginners, 25 lbs	12
Moters, 43 lbs	7
Packer and reinspector	2
	54

It will thus appear that, if the foot-gin be used in an ordinary way, which, with a few exceptions, is the invariable practice, 54 laborers, at an expense to the owner of $27, estimating their services at 50 cents per day respectively, are necessary to the getting of one bag of Cotton properly cleaned. When the gins are propelled by steam, six persons only, male or female, to feed them, are required. If the wool be separated from the seed by Eaves's improved gin, to which steam power is applied, the aid of three men will be needed. In all other respects the labor is the same.

The cultivation and preparation of Cotton, as described in these pages, is peculiarly applicable to the southern half only of the long staple region. In the northern portion, but especially in the Santee country, there are differences in each, which it is important should be briefly noticed. Five acres to the hand, of which generally only one-third is manured, are planted. The ridges are four feet from each other, and the plants stand from 15 to 20 inches apart. In the culture of the crop, a machine of a triangular shape, called "the sweep," is used by a few as an assistant to the hoe. The morning after the Cotton is gathered, according to the wonted usage, it is assorted by the pickers; but, contrary to the plan of the sea-board, not afterwards; unless one or two hands, who attend to the scaffold, may be said to perform that service. The task in moting is from 20 to 25 pounds. The material points of difference, then, in the handling of the crop, between the lower and upper Parishes, or the former and Santee growers, consist in the processes of assorting and moting. The labor of the first is chiefly expended in cleaning the Cotton in the seed; that of the other, after it is ginned. This probably arises from the characteristic features of the two staples. Unless great caution be exercised in the moting of fine Cottons, the fibres will entangle, and the wool become lumpy and stringy. These results do not take place when the coarser qualities are cleaned in the ginned state.

Cotton in primeval times was disengaged from the seed with the fingers. Another mode of effecting that object, still common in certain parts of India, is, however, mentioned by Dr. F. Buchanan in his account of Bahar and Patna. "A great deal of the Cotton," says he, "is freed from the seed by the process of *beating*. At Arwal, the Dhunizas, who make a profession of *beating* Cotton, are allowed $1\frac{1}{2}$ sers of grain for *beating* one ser of Cotton; and in one day a man *beats* four sers, equal to $4\frac{1}{2}$ lbs. and of course receives $6\frac{3}{4}$ lbs. of grain." To the human hand the agency of the roller succeeded. The use of rollers, at first roughly constructed, is of very ancient date. Nearchus speaks of them as employed by the Hindoos for the purpose to which they are now particularly devoted. While a rude hand-mill was employed in the Plantation States, the treadle-gin, or some equally effective machine, was certainly in operation at the North. This appears from the declaration of Richard Leake of Georgia, who, in his letter to Thomas Proctor of Philadelphia, on the subject of Sea-Island Cotton, remarks, "The principal difficulty that arises to us is the cleaning of the seed, which I am told they do with great dexterity in your city with *gins* or machines made for the purpose."*

Soon after the commencement of our Revolutionary struggle, Kinsey Burden, deceased, late of St. Paul's Parish, constructed a roller-gin, believed to have been among the first ever made or used in South Caralina, which enabled him to clothe his negroes in garments fabricated at home. It was composed of "pieces of iron gun-barrels burnished and fixed on wooden rollers, with wooden screws to secure them,

* Ure, p. 145.

* Niles's Register, vol. vi. p. 334.

and wooden cranks to turn in the manner of the steel corn-mill." It was turned by one person and fed by another. Mr. Bisset of Georgia, in 1788, resorted to the "simple plan of a bench upon which rose a frame supporting two short rollers, revolving in opposite directions, and each turned by a boy or girl, and giving as the result of the day's work, five pounds of clean Cotton." These, and many others like them used subsequently in several parts of this State, were in part of the fashion of the Cotton hand-mill of India, which consists of two rollers of teak wood, fluted longitudinally with five or six grooves, and revolving nearly in contact. The upper roller is turned by a handle, and the lower is carried along with it by a perpetual screw at the axis. The present foot or treadle-gin,* first used in Georgia, was imported from the West Indies, and is probably unsusceptible of any advantageous alteration. To prevent the Cotton from being carried round about with the rollers, Mr. Harvie of Berbice, in 1820, obtained a patent for an improvement, which consisted in the application of a thin, long brush to the posterior surface of the rollers. From the liability of these to get hot in their rotation, a patent in the United States was secured by another person, for making them hollow for the free passage of cool air, or even water.

A very decided improvement on the treadle-gin, at least for many years it was so considered, especially in Georgia, was made about the year 1790, by Joseph Eaves, a native of Providence, Rhode-Island, but who then resided in the Bahamas. As originally constructed, Eaves's machine was a double gin, and had two pairs of rollers placed obliquely one above the other. By additional mechanism, consisting of iron teeth and pullies, and by a little assistance, it was made to feed itself. The mill was worked by horses and oxen, or by water. To this succeeded the gin of Mr. Pottle of St. Mary's, Georgia. He substituted two single rollers for the double ones, and placed them back to back, forming an angle with each other; both were driven with the same band-wheels, which were placed above and between them. Pottle's gins continued long in high repute in Georgia, but were used only by few planters in this State. Birney's, Simpson's and Nicholson's gins, and many others, bearing the cognomens of their inventors, followed in quick succession. In Whittemore's machine, it was thought that all the objections to the previous ones had been effectually removed. To run in the easiest possible manner, and to preserve the rollers from being heated, it was provided with friction-wheels and friction-rollers. Although, therefore, from these causes the Cotton received no damage, yet it was soon discovered that it cut the staple, and that this irremediable defect was in proportion to the velocity of the gin. It was consequently abandoned. Farris's and Logan's machines, which are slight modifications in the mechanism of Eaves's invention, were by many successfully employed for years, and they are still partially used with steam as the propelling power. Where this wonderful agent is at command, the common barrel-gin, originally worked by horses or oxen, is probably the most unexceptionable. "It is indeed nothing more than the foot-gin, to which greater power is applied by complicated mechanism. This consists of a large driving cog-wheel, working a small trundle-wheel. This smaller wheel gives motion to a large cylinder or barrel, round which from 8 to 24 sets of bands are passed, communicating with the pullies of as many Cotton-gins, which are fixed in rows on each side of it." As the young, the old and infirm, male or female, can engage at work as feeders, a very material advantage in favor of this gin is secured. To each laborer the daily average is about fifty pounds of clean Cotton.

All of the gins subjected to examination and trial in this State, except the first of Eaves's manufacture, are supplied only with two rollers, both of wood; or one of cast-steel and the other of wood; or both cast-steel, one covered with leather; or both of wood, one also with a leather covering. Cork rollers have also been tried. The desideratum is to prevent injury to the staple, either by cutting or heating it. To accomplish these great ends, at least a half million of dollars has been fruitlessly expended by artists, incited by the expectation of the highest reward, and distinguished for skill and perseverance in their profession. The notice of a new and improved gin* for both green-seed and black-seed Cottons, recently constructed by F. M'Carthy of Alabama, has been favorably received by the public. That it is destined to supplant Whitney's invention is probable from the fact that the Cotton prepared by it commanded, at one time last winter, three cents more per pound in the Mobile market than that cleaned by the latter. That it may subserve the purpose of the grower of Long-Cotton is inferred from the declaration of an acknowledged competent witness. A few pounds of the finest description of that staple ginned by this machine, and unmoted afterwards, the property of ——, was sent by him in December, 1842, to Mr. Houldsworth, the eminent spinner of Manchester, who returned an answer of which the following is an extract:—"We have carefully examined the sample of Mr. ——'s Cotton cleaned on a new ginning machine. It is remarkably clean, and in an excellent state for our purpose as respects openness." The gin, however, may be very liable to get out of order; may continue only for a short time to effect the desired object, and may with difficulty be repaired: in other words, the results of trial may show it to be an expensive mechanical agent.

For the silky Cottons produced on the Sea-Islands of South Carolina, the planter is indebt-

* In 1796, William Brisbane* received several foot-gins from his father-in-law in the Bahamas, which were erected under the direction of, and actually put into operation by, his wife. She had temporarily resided in Providence, and, being of an active and inquisitive mind, watched with interest the different processes of preparing Cotton for market. By this means, she was enabled to do what no gentleman, certainly in that section of the State, could accomplish. What disposition it was proper to make of the seed of the Cotton, which the gins very soon so freely furnished, was rather a perplexing question. Held to be of no value, it was first carelessly thrown on the ground; the hogs ate of it, however, and they died. It was then put into pens, but the pigs found their way between the interstices of the rails, and quickly shared the fate of their elders. As a dernier resort, and with a view permanently to be rid of the "nuisance," it was deposited in a small creek contiguous to the mansion house. There at low water it soon generated a miasmatic odor, which, when the wind was favorable, was so offensive as to create a strong feeling of prejudice against the farther culture of the crop.

* The gentleman named in page 180.

* See Note D. in the Appendix.

ed to the botanical skill and laudable perseverance of Kinsey Burden, Sen. of St. John's Colleton. An improvement in the texture of the wool engaged his earnest attention as early as 1804 or 1805. In one of those years, he raised from selected seed a "pocket" of Cotton, worth in the English market "25 cents per lb. more than any other Cottons at any price." From that time he labored zealously in this new branch of his profession until 1826, when he sold his first full crop, 60 bags, at 110 cents a pound. The crop of the following year commanded 125 cents per lb. It is proper here to observe, that between 1821 and 1829, the average price of common Long Cotton was 24 cents, and of the superior kinds from 35 to 60 cents. Mr. Burden's extraordinary success was for many years the theme of public notice and private discussion. All means to penetrate the arcanum of which intellectual efforts were capable had proved abortive. In March, 1827, "a report accompanied by sundry letters on the causes which contribute to the production of fine Sea-Island Cotton," was read before the Agricultural Society of St. John's Colleton, by their Corresponding Secretary.* The publication† of these papers created some excitement in the parishes. It brought the mind of the planter to bear with more intensity on the absorbing question which the report attempted to discuss. The remarks of the writer on the selection of seed induced many to think, that perhaps to this cause Mr. Burden's celebrity as a seller was indebted. Subsequently, William Elliott of Beaufort, through the pages of the Southern Agriculturist,‡ expressed his belief that the secret was in the seed; hence, that the furred seed should no longer be cast aside. Experiments were then instituted to try the truth of the new opinion, thus for the first time publicly avowed by two, and in conversation by several other persons The clean seed was rejected, and that coated wholly or partially with down, retained. The result was a complete solution of the mystery which had so long enshrouded this subject. One of the experimenters obtained for the small quantity grown by him one dollar a pound. The product, nevertheless, was so meagre as scarcely to be remunerating. This occurred in the year 1829. In the year previous, Hugh Wilson, Sen. of St. John's Colleton, appeared on a small scale, as the rival of his parish fellow-laborer. For ten bags of Cotton he realized 90 cents a pound, and for his two succeeding *crops* $1 and $1 25 cents a pound. For two bags of extra-fine Cotton, raised in 1828, $2 per pound was received, the highest price ever obtained in this or any other country from which Cotton wool is exported. Mr. Burden's discovery was held to be so valuable to the State, that he was induced to forward a memorial to the Legislature offering to sell his secret for $200,000; he resigning all his seed, except what was necessary for his own crop, and communicating the mode of perpetuating the silky properties of the new Cotton fibre.§ The memorial, for reasons satisfactory to the applicant, was never presented.

The farther history of this sudden revolution in one of our chief staples need not be given. It is proper, however, to add, that while the quality of the wool has been vastly improved, the product of the plant has been more than proportionally diminished;* although, therefore, the pecuniary circumstances of individuals have been greatly meliorated, the planters generally have sustained a loss—in some instances to an almost ruinous extent.

Cotton may appropriately be divided into three kinds: 1st. Herbaceous Cotton; 2d. Shrub Cotton; 3d. Tree Cotton.† The first is the most useful, and is cultivated in nearly every country congenial to the gossypium. It exists native at Aleppo, in Upper Egypt, Arabia, and in Senegal. Of the seven varieties‡ of the Shrub Cotton, one or other grows spontaneously in the tropical regions of Asia, Africa, and America. In the latter continent, the Hirsutum or hairy, (seeds greenish,) and the Barbadense§ or Barbadoes Cotton, (a black seed,) are indigenous.‖ To the Shrub species all the South American, and most of the West India Cotton, which is long-stapled, is to be referred. The Tree Cotton, according to one authority, grows in India, China, Egypt, the interior and western coast of Africa, and in some parts of America; by another, it is a native of India, Egypt and Arabia.

Quatremere Disjouval, a prominent member of the Academy of Sciences of Paris, in speaking of the influence of climate on the texture and quality of Cotton, advances the following hypothesis: That the produce of the countries immediately under or nearest the Equator, is to be considered the type of excellence, and is distinguished by its fine silky fibre, the depth and peculiarity of its color, and the hight and permanency of the plant. In proportion, he remarks, as we recede from the Equator, these strong marked characters disappear, the fibre becomes coarse, its color perfect white, and, on the shores of the Mediterranean, we behold the lofty and flourishing tree of Hindostan dwindled down into a stunted annual shrub. Of these broad and unqualified assertions, there is but one that rests on a tenable basis: that the perennial plant of the Equator becomes an annual in a higher latitude. The averment that the finest and the deepest colored Cotton is the produce of the tropical countries is reiterated on

* Whitemarsh B. Seabrook.

† Southern Agriculturist, vol. i. pp. 25, 71, 119.

‡ Southern Agriculturist, vol. i. p. 151.

§ At one time, William Seabrook, a wealthy and enterprising planter of Edisto Island, was prepared, and publicly declared his design, to offer the discoverer $50,000 for the information on this subject of which he was possessed. About twelve months afterward, Mr. S. declined to purchase, because, in his belief, conjecture had yielded to certainty—to the seed solely was traceable the fine Cotton which Mr. Burden continued to grow.

* See Note E. in the Appendix. The diminution in the exports since 1830, when fine Cottons began to be generally cultivated, compared with the eleven preceding years, is very large.

† Among some of the ancient writers, says Dr. Ure, the Cotton Tree, *bombyx pentandrium*, is confounded with the Tree Cotton. The former does not belong to the gossypium family. It was probably the Cotton Tree, "six yards high," which Marco Polo saw growing at Guzzerat.

‡ Gossypium Indicum, or the Indian; viti folium, or vine-leaved; hirsutum, or hairy; religiosum, or the Cotton of Nuns—this species is very difficult to be detached from the seeds: the Nuns at Tranquebar were first employed in the operation; latifolium, or broad-leaved; Barbadense; Peruvianum.

§ Called by the English in the East Indies, says Dr. Ure, the Bourbon Cotton, because, about 26 years ago, it was introduced there from that island. The seed, he farther (erroneously) remarks, originally came from the West Indies.—Pp. 71. 72.

‖ Ure, pp. 65—67.

even higher authority.* This is false as a general proposition, and only true concerning locations. The coarsest Cottons known in commerce, except some from Peru, between 5° and 15° south, which are of a dark hue, and as coarse as the wool of sheep, are the Bengal, 24° north, and the Surat, 21° 10′ north; the finest, and in all other respects the best, Cottons are produced on the Sea-Islands of South Carolina, 15° beyond the Tropic of Cancer. To the latter, as well as those of the Isle of France, 20° 9′ south, Dacca, 23° 55′ north, and Egypt, about 30° north, the Cotton of Guiana, within 5° of the Equator, is decidedly inferior. The worst native Cotton in the east grows in Java, 7° south. The Cottons of South America in the hottest region, it is true, are of a better quality than those of the Levant; on the other hand, some of the West India kinds are lower in value than the green seed varieties of this country. These, too, as is especially the case in our State, oft-times grow within a few miles of the long-staple Cotton, and in certain localities side by side; yet the best sorts of the latter are worth eight hundred per cent. more than the best sorts of the former. So much for the effect of climate on the fibre of Cotton, in opposition to the gradation of the French Philosopher's system. With regard to the color of Cotton, the yellowish hue of which is indicative of fineness, climate has but an inconsiderable effect. The Cottons on the coasts of South Carolina and Georgia are tinged, and some varieties deeply, with yellow, while the inland districts of those States, and their more southern neighbors, as far as the Red River, produce Cotton of great whiteness, and far inferior in strength and fineness. A portion of the West India Cotton is of a cream color; and some from India is represented to have "a slight tinge of Aurora." The Cottons of Bengal, Madras and Surat, of Smyrna, Cyprus, Salonica, and all parts of the Levant, are distinguished by their want of color—this is also said of Siam, famous for its nankeen. The Dacca Cotton† is deeply colored, and, although it is consumed in that Province, and consequently unknown in commerce, still, from an examination‡ of the muslin, denominated, in hyperbolical language, "webs of woven wind," and "which can hardly be felt when expanded," it has been satisfactorily ascertained to be of a coarser fibre than the better qualities of our Cottons, grown near the ocean. While a pound of that Cotton, in a single thread, would extend to the distance only of 115 miles, 2 furlongs, and 60 yards, Cotton Yarn is spun in England, making 350 hanks to the pound weight, each hank measuring 840 yards, and the whole forming a thread fo 167 miles in length.§ Farther, 420 hanks certainly, and, it is asserted, from 480 to 500 hanks per pound, have been spun in Manchester with Cotton from South Carolina—thus yielding a thread from 197 to over 238 miles long.

The valuable properties* of Cotton Wool in their relative order are strength, fineness, length, evenness and freedom from knots and entanglements. The superiority of our Sea Island Cotton over all other kinds,† is owing to their fibres being "spiral springs, singularly adapted to the spinning process, readily entwining with, and sliding over, each other, during the formation of a thread with an easy elastic force. The filaments of these Cottons vary from one to" two "inches, and in breadth from 1-1500th to 1-3000th of an inch."‡

But to return to the subject of our comments. Disjouval's theory is opposed to analogical reasoning. Nature is bountiful in all her works, but these are not bestowed with the hand of favoritism. For poverty of soil, man is blessed with health and the uninterrupted exercise of all his faculties. Where the land is fertile, and teems with a variety of rich gifts, disease is the inseparable concomitant. If certain products grow more luxuriantly in the warmest latitudes, the quality of those products improves as you recede from the Equator, until a point is reached where retrocession takes place, and some other plant is substituted. This is especially true of Cotton. In the exceptions which apparently militate against the general proposition, you still find its truth maintained in the absence of things essential to the cultivator's physical or moral well-being.

To preserve the properties of Cotton, remarkable for production or quality, annual selections, it is here necessary to repeat, are personally

* Rees's Encyclopædia—article *Cotton*.

† A variety of the common herbaceous annual Cotton of India. [*Baines, p.* 62.

‡ This was made by Sir Joseph Banks in India, who used the following language on the occasion? "The portion of skein which Mr. Williams gave to me weighed 34 3-10ths grains; its length was 5 yards 7 inches, and it consisted of 196 threads. Consequently its whole length was 1018 yards and 7 inches. This, with a small allowance for fractions, gives 29 yards to a grain, 203,000 to a pound avoirdupois of 7,000 grains; that is, 115 miles, 2 furlongs, and 60 yards." [*Baines, p.* 59.

§ The value of Cotton Yarn is estimated by its length, and is numbered so as to determine the number of hanks requisite to weigh one pound. One pound of No. 100 contains 84,000 yards. "The extreme of fineness," says Mr. Baines, in his work on the Cotton Manufactures of Great Britain, published in 1835, "to which yarns for muslins are ever spun in England, is 250 hanks to the pound, which would yield a thread measuring 119½ miles. A pound of fine Cotton, manufactured into the finest lace, is worth from 8 to 15 guineas, and has been sold as high as 100 guineas."

[*M'Culloch's Com. Dic.*—article *Lace*.

* Unlike that of flax, which is vitreous, the lustre of Cotton, observes Dr. Ure, is pearly. The flax fibre is straight and jointed like cane, but that of Cotton is either twisted right and left, or coiled like a cork-screw.

† Ten years ago, the difference between the staple of our Sea-Island Cotton and that of Egypt, Brazil, and some of the West India sorts, was about 20 per cent. in favor of the former. Owing to a more favorable climate, superior husbandry, and the raising of superfine qualities, the difference may now be estimated at from 30 to 50 per cent. and over, if the silkiest kinds be included. See Note F. in the Appendix.

‡ Though these Cottons are so much superior to that of Dacca, yet the skillful English weaver, supported by the triumphant results of mechanical science, is unable to compete with the feeble hand of the Hindoo in the manufacture of a certain class of goods. This is ascribable to the remarkable acuteness of external sense, particularly of touch, and the flexibility of the fingers of the people of that region; "the high estimation in which the calling of the weaver is held; and the confining of the production of peculiar kinds of cloth to peculiar districts, in which they have been fabricated from generation to generation." In former days, from 900 lbs. to 1,000 lbs. in the seed were necessary to yield 300 lbs. or one bag of ginned Cotton. Now, in reference to our better qualities, it requires from 5 lbs. to 7 lbs. of the former to make one of the latter. Although a still finer Cotton, it is experimentally known, can be grown, yet, from the poverty of its product, it is believed that the point of perfection, as far as a profitable culture is concerned, has been reached.

made by the planter. A more irksome duty, requiring, too, much experience and skill, is seldom performed. But, in surmounting one difficulty, another of his own creation awaits him. This is imputed to the ill-judged manner of disposing of the seed, which is peculiarly liable to run into varieties. This last consideration readily accounts for the confounding of all distinctions by botanists, and their disagreement as to the number of varieties of the gossypium. Linnæus reckons five, and other writers severally eight, eleven, thirteen, thirty-four, forty, and even one hundred kinds. The varieties are still more difficult to be enumerated in consequence of the influence of climate, soil, manure, cultivation, and intermixture of seeds. These causes not only tend to their multiplication, but to change the longevity of the plant. The shrub cultivated as an annual in one country, becomes perennial in another. The arboreum continues for five or six years in the West Indies—here it is an annual. In, probably, every acre of a Cotton-field several kinds of the gossypium may be found. The differences are sometimes minute, but even without inspection by a botanical eye, they may be detected. The select seed of the grower, by the usual practice, is carefully deposited in choice ground, which, if there be many acres, lies in many instances immediately contiguous to his main crop—sometimes a narrow path alone separating them. Hence the pollen of the larger field impregnates the pistils of the smaller field. In this way the peculiar character of the wool is lost, and another variety springs up. The operation of the *farina fecundans* of plants no longer rests on surmise and conjecture. By the discovery and observation of John Bywater, of Liverpool, on *animalculæ infusoriæ*, and on the physiology of plants, we are furnished with some curious and interesting information on this subject. His examinations go to show that the small capsules of the *farina fecundans* given out when in contact with water, an abundance of animalcules, which are supposed to be the mysterious agents by which vegetable secretions are carried forward. The obvious expedient, then, is the rearing of varieties of the same species at such distances as to prevent the intermixture of pollen of the plants. This is successfully done in Scotland with garden seeds, which, it is asserted, may always be found pure in certain sections of that country. If the size of the plantation admit, unless some such scheme be adopted, specific differences cannot be maintained, and the labor of the planter will be permanent.

The length to which this memoir has already been extended, forbids the introduction of many topics, which otherwise would invite a passing notice. A few remarks, therefore, only on one or two collateral points will now be submitted. In a short time after Cotton, as a crop, had been successfully cultivated in this State, it was attacked by some of its natural foes. In Georgia, the caterpillar, *noctua xylina*, or cotton-moth, made its appearance as early as 1793.* Seven years afterwards, they commenced the work of devastation in South Carolina.† In 1804, the crops, which would have been devoured by them, were, with the enemy, effectually destroyed by the hurricane of that year. In 1825,* the visit of the worm was renewed, and its ravages were universal and complete. In 1827, '29, '33, 34, '40, '41 and '43, the lower parishes† generally, or particular locations, suffered greatly by its depredations.

That the Cotton-moth frequently survives the frosty season is nearly certain. An examination of that neighboring woods, especially after a mild winter, has often been successfully made for that purpose. They were seen by the writer in May last at the edge of a strip of pines, within a few yards of a Cotton field. In the winter of 1825, Benjamin Reynolds of St. John's Colleton, deceased, found them in the woods, principally on the cedar bush, encased alive in their cover, impervious to water, and secured to a twig by a thread. The pupæ, wrapped in Cotton-leaves, from their bleak exposure, invariably die on the approach of cold weather.

The injury that has often been committed by the caterpillar is most incredible. In one week they have denuded of its foliage every stalk in the largest field. The Cotton plant of Guiana was very subject to the attack of the Chenille, as the caterpillar is there called. In the Bahamas, between March and September, 1788, no less than 280 tons of Cotton on a moderate scale were devoured by this worm.‡ Among the causes of failure of the crop in that quarter, as ascertained by answers of the most intelligent and experienced planters to questions proposed by the House of Assembly, the most prominent is the destruction by the Chenille. The same cause produced the abandonment of the gossypium culture in several of the West India Islands.§

It will be perceived, from what has been said, that the attack of the caterpillar in this country is not annual. This of itself is satisfactory evidence, that the "evolution of the larvæ, and the transformations and death of the insect, or the appearance and disappearance of the Chenille, are regulated or influenced by particular states of the atmosphere;" and probably, as close observers have remarked, by "the phases or changes of the moon." Every effort which the most scrutinizing and active minds have hitherto suggested to prevent their propagation, or to render innoxious the career of these insatiable depredators, has utterly failed. From this consideration, added to their great tenacity of life and extraordinary fecundity, it is supposed that the ordinary means of affecting either of those desirable ends will never succeed. The caterpillar, after being plunged into spirits of turpentine or corrosive sublimate, is as ready for his all-day meal, as though it had been immersed in pure water. If the section of the field in which the pupæ only are seen, be burnt, the progress of the worm, as experience testifies, will scarcely be impeded. Lime will quickly produce death, and so will oil rubbed on the abdomen, but how can these be used efficaciously on the larvæ, when from five to ten hundred on a plant are not unfrequently seen? Or can the pupæ, reposing in their glutinous cells, be affected by any external application? In this way the planter reasons, and when the enemy appears, no means whatever are now

* "In that year," says Mr. Spalding, "the destruction was complete. From Major Butler's field of 400 acres, only 18 bags were made."

† This is accounted for by the fact that Long Cotton, as a crop, was not generally grown in South Carolina until 1798.

* Between 1804 and 1825 their depredations were only occasional, and then confined to particular fields.

† The caterpillar is seldom seen in the upper parishes.

‡ Edwards's West Indies.

§ Edwards's West Indies.

employed to preserve the fruits of his labor. As it is the will of Providence, he assures himself submission becomes a duty.

In relation to this matter, it may be asked—is the object at which the grower has so long aimed, unattainable? Let the following statement answer. The caterpillars appeared in several parts of the field of John Townsend, of St. John's Colleton, early in August last. The plants were luxuriant in growth, and tender in weed and leaf, and the weather being warm and rather moist, was altogether propitious to the spread and multiplying of the worms. By the adoption of prompt and vigorous measures, some of which are new, and a rigid perseverance in their execution, his crop escaped unscathed, while many of his fellow-laborers, who lacked faith in any remedy, suffered greatly. In the attainment of his purpose, the means resorted to by Mr. Townsend were the following:

1. His people searched for and killed both the worm and the chrysalis of the first brood.

2. On the appearance of the second brood, he scattered corn over the field to invite the notice of the birds, and while they depredated on the worms on the tops of the stalks and their upper limbs, the turkeys destroyed the enemy on the lower branches.

3. When in the aurelia state, the negroes crushed them between their fingers.

4. Some patches of Cotton, where the caterpillars were very thick, and the birds and turkeys could not get access to them, were destroyed.

5. The tops of plants, and the ends of all the tender and luxuriant branches, where the eggs of the butterfly are usually deposited, were cut off.

By these means, resolutely pursued, although at one time the prospect of checking the depredators was almost cheerless, not the slightest injury to the field was sustained.* As the reasons for the measures adopted by Mr. Townsend are perhaps apparent, it behoves the planter to reflect that, on the first visit† of the caterpillars, while their number is few, they might be, if not entirely gotten rid of, materially lessened; that in the pupa state they are easily detected, and of course as easily killed; and that while early and indefatigable exertions may be crowned with success, delay or tardiness in his operations will certainly be fatal.

In Georgia, the attack of the red bug, a winged insect with a long proboscis, with which it pierces the green pods, extracting the juices of the seed, and leaving the capsules blighted and hard, and the Cotton stained of a deep yellow or red color, are coëval with that of the caterpillar. Although this insect is an occasional depredator in the fields of this State, yet no material loss has been sustained by it. This is also true of the *apata monachus*, a species of the scarable, the larvæ of which, eating with a revolving motion, penetrate to the wood and pith of the Cotton-stalk. Red bugs, that prey on the roots and leaves of Cotton, usually early in May, though their appearance is not uncommon in April, are certainly becoming more destructive and extensive in their visits. By the latter, the growth of the plant is in general only checked; but the former,* by arresting the ascent and circulation of the sap, generates a disease, which, if it do not destroy, renders the plants comparatively barren. The grub or cut-worm, if the spring be cold, and east winds prevail, is a troublesome, but not a formidable, enemy. The blast or blight is now, perhaps, the most common of all the diseases to which Cotton is liable. Its tendency is to check or destroy the vegetative powers of the plants. The causes of blast are three-fold:—excess of vegetation, corresponding with plethora in animals; exhaustion of vegetation, terminating in a state similar to gangrene; and wetness at the roots. When the first takes place, the Cotton is pronounced "flaggy;" the appearance of the second is denominated "canker," of which there are two kinds: in one the plant is stripped of its fruit and foliage, except a few green buds on the top; in the other, the leaves wither—the stalks assume a dark hue, and the pods drop, save those nearly full grown, which become hard and black, though they produce Cotton. In relation to the third cause, as long as the roots are saturated with water, the procreative energies of the plants are arrested, and all the fruit previously formed quickly disappears. While the manuring system, where judiciously practiced, has almost effectually removed one cause, and the main one, arising from vegetative exhaustion,† it has palpably increased the plethoric habits of the plant, and multiplied the number of its diseases, most of which, there are good grounds for believing, is animal. It should, hence, be the paramount duty of the grower, unless an antidote, like salt for instance, be applied, to use sparingly those manures, which furnish a matrix for generating or nourishing the insect brood.

It has been well said by a judicious observer‡ that, of all the productions to which labor is applicable, the Cotton plant, more particularly the species grown on the Sea-Islands, is the most precarious. In its first stage it is attacked by the grub; it is devoured by bugs in the second; and by caterpillars in the third; it is often withered by the wind in its infancy, and by the blight in maturer age; and when the grower, excited by all the causes which hope so kindly presents to his ardent imagination, is about to reap the golden harvest, an equinoctial gale, or a few saturating showers, deprive him at once of the fruits of his labors, and bid him to reâssume the toils and vexations of his vocation. And here it may pertinently be added, that "when the produce is raised, at an expense to the cultivator which perhaps is not equaled in any other pursuit—an expense too that is permanent and cer-

* The experiment cost Mr. Townsend 2½ acres of Cotton, about 15 bushels of corn, and the work of all his people for about five days. This gentleman was roused to unusual action by the reflection, founded on analogical reasoning, that, of one moth of feeble wing and tender body, which a vigilant eye might discover and destroy, the progeny in six weeks amount to at least twenty-six millions of worms.

† This is communicated to the planter through the sense of smell. When the Chenille appears, a very fragrant odor issues from the field, which is not possessed by the worm itself, or the plant separately.

* Wherever salt is applied on the listing, at the rate of one pint to the task-row, (105 feet,) it is confidently believed that the bug will not appear.

† Sometimes on poor high land, assisted with any matter, salt-mud especially, that brings the plant rapidly to maturity, this disease will appear, if a drouth be succeeded by heavy rains in August. To prevent this, do not use mud alone, but in connection with some stimulating aliment. Such lands should not be planted until the last of April.

‡ Bryan Edwards, in his History of the West Indies.

tain, while the returns are more variable and fluctuating than any other—the selfish and grasping policy of man is oftentimes more destructive than even the anger of Omnipotence."

Apart from the suicidal legislation of the Federal authorities, our planters have no cause for despondency. Every view of the subject on the contrary imperiously invites them to persevere. In confirmation of this assertion, there are two considerations, one of a general and the other of a local character, to which I would briefly invite your notice—the first showing, that better and cheaper Cotton can be grown in this country than in any other section of the world; the other, that by a little more attention to the processes that succeed the gathering season, the disparity between the South Carolina planter and his more southern associates, in relation to the money value of their respective crops, would be considerably lessened. And, first, in reference to nearly every part of the globe where Cotton is grown for European consumption and manufacture, it is undeniable that, while the production of the raw material in the United States is rapidly extending, in other countries it is either stationary or diminishing.* Secondly, although with regard to the amount of Cotton per acre, South Carolina cannot compete with the Gulf States,† yet her planters, in consequence of this apparent misfortune, are enabled to send the wool to market greatly improved in value by a superior mode of handling. One cent more per pound, occasioned by a better style of preparation, taking the crop of last year as a basis, would yield to the growers over $900,000.

The American saw-gin, and the wonderful discoveries and inventions in England in the operations of carding, spinning,‡ and weaving Cotton, gave birth to the Cotton-husbandry in the United States. The application of steam to the propelling of the Cotton-machinery, and for purposes of navigation: the improvements in ship-building, which enable vessels that formerly carried only 900 pounds to the ton of register, now to carry from 1500 to 2000 pounds to the ton, separate from the skill and industry of the cultivator, have materially contributed to its unparalleled extension.

In consequence of its abundance, and the facility with which it can be twisted into a thread, Cotton is the cheapest of all the materials for clothing: and what, perhaps, is of scarcely less importance, it is in a high degree conducive to health. For these reasons, it is gradually supplanting flax, silk, and wool, as an article of wear, or forms a component part of all of them. From its exchangeable value, and constituting as it does more than one-half of our exports,* it has greatly accelerated the growth and flourishing condition of the Plantation States; aided to build up the prosperity of their political associates, and added vastly to the wealth and greatness of the Union.† Nor has its benefits been confined to the North American republic. The enlargement of our Cotton-husbandry, by arousing the energies of the British artists, created many of those extraordinary mechanical improvements, which have essentially contributed to render England the most powerful nation of which history furnishes an example. The community of interests existing between that sea-girt isle and our highly favored land, owes its strength and maintenance to the downy fleece of a long-neglected shrub, which, by the unexampled skill and ingenuity of the one, and the untiring industry and perseverance of the other, has become "the wonder of agriculture in the United States, and the miracle of manufacture in Europe." Without attempting to show the manifold blessings that Cotton has conferred on the political and social conditions of other nations, it may perhaps be only necessary to remark, that every where society feels its friendly and invigorating influence. All classes and occupations, though its culture and manufacture, on an extended theatre, are of modern date, already acknowledge that the "vegetable wool" is among the greatest gifts of God to his people.

The grand revolution which has increased the production of the gossypium in this country over 5,676 times in half a century, has been brought about not by governmental patronage and the influence of monopolies, but against the unceasing plunderings of the one at the resistless and unrelenting fiat of the other. The history, indeed, of no pursuit affords so extraordinary a result from the isolated labors of its followers, and under circumstances so oppressive and discouraging, as that of the Cotton-grower of the United States. He sows, and endures the heat and burden of the day, but others riot in the harvest. A juster and nobler policy, it is hoped, will ere long direct the Federal councils. England now pays to America thirty-five millions per annum for a single product of our fields. To keep her in this position is a task of easy accomplishment, if commerce be free, and the planter be released from the shackles of pernicious and unwarrantable enactments. As an exporter of the main crop of both countries, Texas can never be the rival of the United States, unless the spirit that has so long swayed the constituted authorities of the latter shall unfortunately continue in the ascendant. Under the guidance of a patriotic home legislation and international interests, these co-terminous communities would constitute the region which might abundantly supply the nations of the globe with its great staple commodity, and at a lower rate, too, than ever was done by the labor of man.

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* Note A, and Tables 3 and 4, in the Appendix.

† While the production of the Gulf States has doubled itself for the eighteen years from 1824 to 1841 inclusive, that of the Southern Atlantic States for the same period has remained nearly stationary.

Actual average of the eighteen crops from 1824 to 1841:—

	1st 6 years.	2d 6 years.	3d 6 years.
	Bales.	Bales.	Bales.
Gulf States	253,000	504,000	1,030,000
South'n Atlan' States	433,000	562,000	529,000

‡ Of the inventions of the "water-frame," by Arkwright, the "spinning-jenny" by Hargreaves, and the "mule-jenny" by Samuel Crompton, the first two occurred a short time before the American Revolution—the last in 1774. "Of the four great divisions of the globe," remarks Mr. Baines, "Europe was the last to receive the Cotton manufacture, and England was among the last to engage in that branch of industry. So immense is the extent of the British Cotton manufacture at this time, (1835,) that the yarn spun in a year would, in a single thread, pass round the globe's circumference 263,775 times: it would reach 51 times from the earth to the sun; and it would encircle the earth's orbit eight and a half times. The wrought fabrics of Cotton exported in one year would form a girdle for the globe, passing eleven times round the Equator."

* The total value of the exports of the produce of the United States during the year ending on the 30th of September, 1841, was $106,782,722. Of this Cotton furnished $54,330,341, or more than one-half. South Carolina, as her share, contributed $8,011,392.

† It is generally understood that the manufacturers are realizing 40 per cent. on their capital.

APPENDIX TO THE COTTON PLANT.

NOTE A....*Exports of Cotton grown in the Plantation States of North America.*

Year.	*Lbs.*	*Year.*	*Lbs.*
1784	*1,200	1814..(War)..	17,806,479
1785	*2 100	1815	82,998,747
1786	*900	1816	81,747,116
1787	*16,350	1817	85,649,328
1788	*58,350	1818	92,471,178
1789	*126,300	1819	87,997,045
1790	*12,150	1820	127,860,152
1791	189,316	1821	124,893,405
1792	138,328	1822	144,675,095
1793	487,600	1823	†173,723,270
1794	1,601,700	1824	142,369,663
1795	†6,276,300	1825	176,439,907
1796	†6,106,729	1826	204 535,415
1897	3,788,429	1827	294,310,115
1798	9,360,005	1828	210,590,463
1799	9,532,263	1829	264,847,186
1800	17,789,803	1830	298,459,102
1801	20,911,201	1831	270,979,784
1802	27,501,075	1832	322,215,122
1803	41,105,623	1833	‡397,780,020
1804	38,118,041	1834	413,928,240
1805	40,383,491	1835	449,039,250
1806	37,491,282	1836	469,566,900
1807	66,212,737	1837	594,494,010
1808 (Embargo)	12,064,366	1838	448,975,560
1809 "	53,210,225	1839	118,685,550
1810 "	93 874,201	1840	539,531,850
1811 "	62,186,081	1841	555,579,420
1812..(War)	28,892,544	1842	†785,221,800
1813.. "	19,399,911		

* From 1784 to 1890, inclusive, the number of bags exported (Note B) was respectively 8, 14, 6, 109, 389, 842, 81, which are estimated as weighing 150 lbs. each.

† Some foreign Cottons included.

‡ The bags from 1833 to 1842, inclusive, are estimated to weigh 330 lbs. each.

NOTE B....*Early Imports of American Cotton.*

[From Gore's Liverpool Advertiser.]

"By referring to our import list at the period of which the following is a copy, we find the first arrival of Cotton wool, the produce of the United States of America, took place at this port, 20th January, 1785, of one bag, per Diana from Charleston, to John and Isaac Teasdale & Co. We have had this confirmed by the only surviving partner of that firm, William Teasdale of this place, whose uncle Isaac went from Manchester to settle at Charleston to promote the trade.

"An account of the import of the first Cotton brought to the port of Liverpool, the growth of the United States of America, 1785. Jan. 20th, Diana, from Charleston, to J. & I. Teasdale & Co. one bag; Feb. 17th, Tonyn, New-York, James Kenyon, one bag; July 21st, Grange, Philadelphia, W. Rathbone, Jun. 3 bags; Nov. 17th, Friendship, Philadelphia, J. & I. Teasdale & Co. 9 bags. Total, 14 bags.

"1786. May 4th, Thomas from Charleston, Peter Marrow, 2 bags; June 21st, Juno, Charleston, J. & I. Teasdale & Co. 4 bags. Total, 6 bags.

"1787. April 5th, John from Philadelphia, John Jackson, 6 bags; June 7th, Irish Volunteer, Charleston, James Hargreaves, one bag; June 14th, Wilson, New-York, N. P. Ashfield, 9 bags; June 28th, Grange, Philadelphia, James Barrow, 6 bags; James Appleton, 2 bags; Peel, Yates & Co. 1 bag; August 2d, Henderson, Charleston, J. & I. Teasdale & Co. 40 bags; Dec. 13th, John, Philadelphia, George Goring, 37 bags; Order, 7 bags. Total, 109 bags.

"1788. January, Mersey from Charleston, Peter Marrow, 1 bag; Grange, Philadelphia, George Goring, 5 bags; Jan. 31st, Sally, New-York, Rathbone & Benson, 4 bags; June 26th, John, New-York, Samuel Green, 30 bags; July 3d, Harriott, New-York, Backhouse & Lowe, 62 bags; Dickson & Pemberton, 60 bags; N. P. Ashfield, 29 bags; Peel, Yates & Co. 4 bags; Rathbone & Co. 3 bags; S. Newall, 1 bag; Order, 16 bags; July 5th, Grange, Philadelphia, Jas. Ansdell, 68 bags; Polly, Charleston, George Goring, 42 bags; J. & I. Teasdale & Co. 26 bags; Nov. 20th, Clio, Charleston, J. Douglass, 9 bags; William, Baltimore, Warbreck & Holt, 31 bags. Total 389 bags.

"1789. Jan. 8th, Grange, Philadelphia, W. Wallace, 4 bags; James Ansdell, 6 bags; Feb. 5th, Manchester, Charleston, J. Teasdale & Co. 7 bags; John Wright, 1 bag; Feb. 29th, Aurora, New-York, Rathbone & Benson, 165 bags; Peel, Yates & Co. 1 bag; Backhouse & Low, 7 bags; Order, 158 bags; May 21st, Alexander, Virginia, Thomas Moss, 4 bags; July 2d, Levant, Philadelphia, E. & R. Bent, 7 bags; John Jackson, 25 bags; July 9th, Grange, Philadelphia, John Jackson, 17 bags; July 23d, Manchester, Charleston, J. Coulburn, 6 bags; Oct. 1st, Lydia, New-York, James Kenyon, 10 bags; Robert Abbott, 10 bags; J. R. Freme, 2 bags; Dec. 10th, Springvale, Maryland, Kensington & Co. 71 bags; Rathbone & Co. 30 bags; Dec. 24th, Grange, Philadelphia, Golightly & Co. 2 bags; James Ansdell, 25 bags; S. Brown, 4 bags; Samuel Grey & Co. 43 bags; C. Weatherhead, 94 bags; J. Jackson, 43 bags; J. Micklethwaite, 100 bags. Total, 842 bags.

"1790. January, Lady Penrhyn from Philadelphia, E. & R. Bent, 58 bags; Feb. 4th, Polly, Charleston, John Teasdale & Co. 12 bags; William Coulborne, 7 bags; July 29th, Mary, Georgia, Andrew Aikin, 2 bags; Polly, Charleston, John Teasdale & Co. 2 bags. Total, 81 bags.

"It will thus be perceived, that the total import of Cotton into Liverpool during the six years from 1785 to 1790, inclusive, was 1441 bags. Though the above statement shows a progressive increase, it appears that the demand was neither uniform nor extensive, the import in 1789 having exceeded that of the following year 731 bags. From this period, however, the trade, especially as regards Liverpool, has increased with astonishing rapidity. In the year 1785, the import amounted to no more than 14 bags, and, in 1789, which is the largest import shown in the above statement, it was 842 bags."

NOTE C....*Properties of Marsh-Mud*....[Referred to at page 223.]

When dried.	*Water of absorption.*	*Organic matter.*	*Increase in weight after being thoroughly drenched in water.*	*Rates of drying from a condition of saturation.*	*Silica.*	*Alumina.*	*Water of absorption and organic matter.*	*Peroxide of iron with carbonate of lime and phosphorate of lime.*	*Carbonate of lime.*	*Phosphate of Lime.*	*Peroxide of iron.*	*Oxide of iron and phosphate of lime.*
A	lost.											
B												
C	2.37	2.66	321.	14.0 of water	92.57	1.70	5.03	0.70				
D	2.83	3.83	342.		91.64	1.70	6.16	0.50				
E	2.66	1.90	305.		94.00	0.94	4.56	0.50				
F	1.66	1.75	293.	11.0	95.00	0.79	3.41	0.80				
G	2.83	2.16	325.		93.00	0.81	4.99	1.20				
H	2.36	2.41	315.	12.0	93.23	1.05	4.77		0.35			0.60
I*	11.36	8.33	480.	28.7								
K*	.14	9.66	605.	39.0	61.75	9.00	23.66		0.29	.20	5.80	
Pure Sand			235.	6.8								

* Marsh-Mud.

NOTE D.

"To an iron frame, 4 feet breast and 3 feet high, is attached in front, in a horizontal position, a 2 inch roller, covered with the best kind of sole-leather, grooved (say 1-16th of an inch deep) diagonally—the grooves being an inch apart. Pressing lightly against this roller, from the centre upwards, and confined to its place by small steel clamps, is a very thin steel plate, made perfectly smooth and beveled on the under side, which comes in contact with the roller. On each end of this roller is a pulley, connected with other pulleys by bands. The Cotton is placed on a feeding-board, and drawn in by the action of the roller between it and the plate the entire length of the fibre, (the seed exposed and resting against the plate,) where it is held firmly. In the mean time a vibrator (which is a plate of iron 2 inches broad with square notches in the upper edge, and screwed to a piece of wood to support it) attached to two upright pieces of wood an inch square, which are attached to each end of an iron shaft ($1\frac{1}{2}$ inch in diameter and placed in a horizontal position,) by means of sliding cranks, which give an eccentric motion, and cause it (the vibrator) to play up and down with great velocity, just clearing the plate; pushing the seeds upwards; clearing the Cotton, which, thus relieved, passes on (the leather or ginning roller being cleared by a smaller one resting on it, and lying just behind the plate) to an endless apron, 8 inches broad, which is made to revolve on two rollers of $1\frac{1}{4}$ inch diameter, and which is placed in close proximity to the ginning-roller. The cleaning-roller passes the Cotton under another roller ($1\frac{1}{4}$ inch diameter) to the apron, around which it adheres, and by this process the fibre is straightened.

"The apron is cleared, after thirty revolutions, by means of a cam, which is placed over the apron, near the back part of the gin; the edge of this cam is made to come regularly down to the apron by a finger attached to one end of it; a racket-wheel throws this finger under a segment of a circle, attached to the pulley which drives the ginning-roller, and thus holds the cam to the apron during one revolution; the edge of the cam is then brought clear of the apron by weights and the Cotton falls to the floor in a bat.

"The above is the plan of the gin as first exibited. I have since simplified it somewhat by taking off the apron, cam, &c. and substituted 4 rollers in their place—placing them immediately back of the ginning and clearing rollers, through which the Cotton passes and falls in flakes on the floor."—[*Extract of a letter from H. W. Fargo of Savannah, Mr. M' Carthy's agent for Georgia, to the writer.*] The price of a single gin is $150.

NOTE E....*Number of pounds of Sea-Island Cotton exported from the United States.*

Year.	*Lbs.*	*Year.*	*Lbs.*
1805	8,757,659	1824	9,525,722
1806	6,096,082	1825	9,655,278
1807	8,926,011	1826	5,972,852
1808 (Embargo)	949,051	1827	15,140,798
1809 "	8,664,213	1828	11,288,419
1810 "	8,604,078	1829	12,833,307
1811 "	8,029,576	1830	8,147,165
1812..(War)	4,367,806	1831	8,311,762
1813.. "	4,134,849	1832	8,743,373
1814.. "	2,520,388	1833	11,142,987
1815	8,449,951	1834	8,085,935
1816	9,900,326	1835	7,752,736
1817	8,101,880	1036	8,544,419
1818	*6,035,700	1837	5,286,971
1819	*11,015,070	1838	9,286,340
1820	*11,718,300	1839	5,107,404
1821	11,344,066	1840	8,779,669
1822	11,250,635	1841	*6,752,130
1823	12,136,688	1842	*8,016,030

* The bags estimated to weigh 330 lbs. each.

NOTE F.

The recognized distinctions of Cotton on the Continent of Europe are as follows:—1. The North American; 2. The West Indian; 3. The South American; 4. The East Indian; 5. The Levantine; 6. The African; 7. The Italian; 8. The Spanish.

The relative value of the above Cottons is as follows:

Sea-Island, Bourbon, Egyptian.

Maragnan, Bahia, and Pernambuco; Motril, from the Kingdom of Grenada; Cayenne, Surinam, Demarara, and Berbice.

Superior West Indian, New-Orleans, Upland Carolina, Georgia, Tennessee, Inferior West Indian.

Levant—European and Asiatic Turkey.

Italian, Madras, Surat, Bengal.

TABLE I....*Import of Cotton Wool into Liverpool, in packages, from the year* 1791 *to* 1823.
[Statistics of Liverpool, page 147.]

In the year	Portugal.	Brazil.	Holland.	Turkey.	America.	Demerara.	West India.	Surinam.	East India.	Ireland.	Total.
1791	34,500		1,950	2,242	64		25,777			3,871	68,404
1792	37,268		651	79	503		27,340			6,423	72,264
1793	6,541			288	111		14,694			3,337	24,971
1794	17,028		380	853	348		17,792			1,621	38,022
1795	21,841		319	32	2,147		29,539			963	54,841
1796	30,721				4,668	1,730	25,110			1,297	63,526
1797	28,314				5,193	3,073	19,006			2,672	58,258
1798	29,095				12,163	5,506	21,612	110		147	69,634
1799	25,362				13,236	8,102	38,394			1,690	86,784
1800	19,947				24,138	10,976	32,362	2,804		2,353	92,580
1801	25,003				32,621	8,831	28,437	2,216		1,644	98,752
1802	47,300		295	40	55,749	8,757	21,814	836		391	135,182
1803	49,916		307		70,579	2,567	14,651			2,107	140,127
1804	35,697				78,324	24,522	13,788	225		690	153,246
1805	39,416				101,045	16,426	17,286	3,082		1,429	178,684
1806	35,293				100,273	17,338	18,383	1,445		540	173,278
1807	11,852				143,756	21,092	18,956	1,331		359	197,346
1808	3,032	3,540		527	25,426	16,329	15,178			2,183	66,215
1809	86,880	412		3,713	130,581	15,998	25,687			4,015	267,283
1810	11,500	61,724		1,199	199,220	22,258	18,300	1,219		5,182	320,600
1811	698	45,485		342	97,626	19,798	6,927	734		1,182	172,792
1812	1,639	61,037	582		79,528	18,704	7,904	541		1,839	171,774
1813		88,113	409		18,640	14,310	12,223	1,253		6,334	141,282
1814		103,248	136		40,448	15,512	17,341	1,599		4,439	182,721
1815		68,952			160,128	18,401	11,712	1,222	1,484	1,608	270,984
1816		93,730	21		142,120	20,961	8,371	542	10,414	439	276,525
1817		100,259			164,152	13,563	12,518		23,689		314,181
1818		139,247			173,000	14,410	12,612		86,126		425,395
1819		131,701			175,545	9,865	7,038		62,037		366,186
1820		161,628			272,574	10,262	6,561		7,668		458,693
1821		114,951			271,649	9,553	13,149		3,849		413,151
1822		135,682			291,293	14,640	10,123		2,165		453,903
1823		138,759	903		410,782	8,962	11,212		7,929		578,547

Imports selected from other sources from 1824 *to* 1843.

In the year	Portugal.	Brazil.	Holland.	U. S. America	Demerara.	West Indies	East Indies.	Ireland.	Surinam.	Egypt, Lev'nt	Total.
1824											
1825											
1826		53,128		369,337		11,810	13,914			39,343	487,532
1827		115,704		592,163		20,485	13,656			13,955	755,963
1828		162,465		414,248		13,375	16,645			24,667	631,400
1829		157,329		429,640		14,663	16,587			22,458	640,677
1830		189,754		571,848		7,289	14,087			11,062	794,040
1831		164,344		560,389		7,947	33,601			27,089	793,370
1832		111,607		584,006		6,342	45,007			32,470	779,432
1833		162,414		619,987		10,034	49,256			2,169	843,860
1834		100,372		670,755		15,218	46,384			6,155	838,884
1835		142,312		707,317		21,277	63,409			35,699	970,014
1836		147,268		712,343		29,528	102,801			31,682	1,023,682
1837		113,121		786,907		25,925	74,650			35,700	1,036,303
1838		137,303		1,073,007		28,317	64,427			28,033	1,331,097
1839		97,033		782,861		30,123	74,640			30,520	1,015,177
1840		82,664		1,066,413		20,153	109,053			36,815	1,416,098
1841		89,534		844,601		27,300	162,560			38,014	1,161,949
1842		85,560		965,040		16,720	169,690			18,000	1,255,010
1843		98,586		1,287,013		15,071	110,869			46,150	1,557,712

TABLE II....*Account of the Imports of Cotton Wool into Great Britain, from* 1781 *to* 1843, *inclusive.*

Year.	*Lbs.*	*Year.*	*Lbs.*	*Year.*	*Lbs.*	*Year.*	*Lbs.*
1781	5,198,778	1797	23,354,371	1813	51,000,000	1829	221,800,000
1782	11,828,039	1798	31,880,641	1814	60,100,000	1830	261,200,000
1783	9,735,663	1799	43,379,278	1815	99,300,000	1831	280,500,000
1784	11,482,083	1800	56,010,732	1816	93,900,000	1832	287,800,000
1785	18,400,384	1801	56,004,305	1817	124,900,000	1833	304,200,000
1786	19,475,020	1802	60,345,600	1818	177,300,000	1834	320,600,000
1787	23,250,268	1803	53,812,284	1819	149,700,000	1835	361,700,000
1788	20,467,436	1804	61,867,329	1820	143,900,000	1836	410,800,000
1789	32,596,023	1805	59,682,406	1821	129,000,000	1837	408,200,000
1790	31,447,695	1806	58,176,283	1822	142,200,000	1838	501,000,000
1791	28,706,675	1807	74,925,306	1823	188,100,000	1839	388,600,000
1792	34,997,497	1808	43,605,982	1824	143,700,000	1840	583,400,000
1793	19,040,929	1809	92,812,282	1825	222,400,000	1841	489,900,000
1794	24,358,567	1810	132,488,935	1826	171,500,000	1842	528,500,000
1795	26,401,340	1811	91,576,535	1827	271,100,000	1843	667,000,000
1796	32,126,357	1812	63,000,000	1828	218,800,000		

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TABLE III....*Statement of the Imports of Cotton Wool into Great Britain, from* 1806 *to* 1843 *inclusive.*

Import.	1806	1807.	1808	1809.	1810.	1811.	1812.	1813.	1814.	1815	1816.	1817.	1818.	1819	1820.	1821.	1822.	1823.	1824.
Amer..	124,939	171,267	37,672	160,180	246,759	128,192	95,331	37,720	48,853	203,051	166,077	199,669	207,580	205,161	302,395	300,070	329,906	452,538	282,371
Brazil...							98,704	137,168	150,930	91,055	123,450	114,518	162,499	125,415	180,086	121,035	143,505	144,611	143,310
E. India	136,799	111,400	130,466	280,202	314,414	198,039	2,607	1,429	13,048	22,357	30,670	120,202	247,659	184,259	57,923	30,095	19,263	38,393	50,852
Egyp.&c																		5,623	38,022
W. India							64,563	73,219	74,800	52,840	49,235	44,872	50,991	31,300	31,247	40,428	40,770	27,632	25,537
Total bls	261,738	282,667	168,138	440,382	561,173	326,231	261,205	249,536	287,631	369,303	369,432	479,261	668,729	546,135	571,651	491,678	533,444	668,797	540,092

Import.	1825.	1826.	1827.	1828.	1829.	1830.	1831.	1832.	1833.	1834.	1835.	1836.	1837.	1838.	1839.	1840.	1841.	1842.	1843.
Amer...	423,446	395,852	646,776	441,390	463,076	618,527	608,887	628,766	654,786	733,528	763,199	764,707	844,812	1,124,800	815,590	1,236,313	902,541	1,018,960	1,397,351
Brazil...	193,942	55,590	120,111	167,362	159,536	191,468	168,288	114,585	163,193	103,646	143,572	148,715	117,005	137,500	99,320	84,891	89,994	85,660	98,715
E. India	69,484	64,699	73,738	84 855	80,489	35,019	76,764	109,298	94,698	89,098	117,965	219,493	145,174	107,200	132,830	216,651	275,770	254,770	181,992
Egyp.&c	111,023	47,621	22,450	32,889	24,739	14,752	38,124	41,183	3,893	7,277	43,721	34,953	41,193	29,700	31,640	36,722	39,304	18,000	46,506
W. India	31,988	18,188	30,988	20,056	18,867	11,721	11,304	8,490	13,616	17,485	22,796	33,506	27,791	29,400	37,000	25,831	34,050	20,740	19,583
Total bls	820,883	581,950	894,063	749,552	746,707	871,487	903,367	902,322	930,216	951,034	1,091,253	1,201,374	1,175,975	1,428,600	1,096,280	1,600,426	1,341,659	1,398,120	1,644,147

The imports from 1812 to 1838, inclusive, are extracted from William Kelly & Co.'s statement; from 1839 to 1842, inclusive, from the "Annual Statement of Imports and Stocks of General Produce," published in Liverpool, December 31st, 1842.

Liverpool Prices Current, 31*st December of each year.*

[From William Kelly & Co.'s Statement, published at Glasgow.]

Descrip.	1806.	1807.	1808.	1809.	1810.	1811.	1812.	1813.	1814.	1815.	1816.	1817.	1818.	1819.	1820.	1821.	1822.	1823.	1824.
	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.
Sea-Isl'd							33 @39	40 @48	42 @57	26½@34	25½@30	28 @36	33 @48	26 @36	17½@28	14½@28	14½@24	13 @22	17 @27
Orleans							22½ 25½	29 31	27 28	16 21	18 22½	20 24	16½ 21	12½ 17	8¼ 14	8½ 12½	7 11	8 11½	9 12
Upland.	15 @21½	15½@19	15½@36	14 @34	14½@22½	12¼@16	21¼ 23	27 29	22¾ 24	14½ 18	17½ 20½	19 22½	17 19¾	12½ 13¾	8 10½	7¾ 11	6¼ 8½	7¼ 9¾	9 10½
Egypt'n																		10 11	10¾ 11½
Pernam.							26½ 27	33 33½	31 31½	27 27½	22¾ 24¼	24½ 25	22 23½	16¾ 17¾	11½ 13	11½ 12½	10½ 11½	11 12	11¾ 13
Maranh.							25½	31½	28¾ 29	24 24½	22 23	23½ 24	20 20½	15¾ 16	11¼ 12	11 11½	9½ 10¼	10½ 11	10½ 11¾
Demera							23 27	27 33	26 29½	21 25½	19½ 23½	21 24½	19 24	14 18	11 14	9½ 13	8½ 11½	10 12	10 13
W. India							21 22	27½ 28½	24 26	20 22	18 19½	20 22	17 18½	12 13½	10 11½	8 9½	7½ 8½	8 9	8 9
Surat...							13 16	17 20	17 20	14 17½	14½ 17	15½ 19½	8 14½	7½ 12	6¾ 9½	6½ 8½	5½ 7¼	6 7½	5¾ 8

Descrip.	1825.	1826.	1827.	1828.	1829.	1830	1831.	1832.	1833.	1834.	1835.	1836.	1837.	1838.	1839.	1840.	1841.	1842.	1843.
	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence.	Pence
Sea-Isl'd	20 @27	10 @20	11¼@18	12 @20	11½@21	11½@20	9½@18	10¾@18	13½@20	18 @20	14½@30	18 @36	14 @30	15 @33	18 @34	13½@30	10 @24	8 @20	10½@20
Orleans	8 12	7 9	5½ 8¾	6 9	5⅞ 8	6¼ 8	5 8	6½ 9	7½ 11	8½ 12	6⅞ 12	7¼ 13	6¾ 9½	6¾ 10	6 8	5¼ 7¾	4¾ 7½	4½ 7½	4¾ 7
Upland.	6½ 9½	6¾ 7½	4⅞ 7	5¾ 7	5¾ 7	5⅞ 7⅜	4⅞ 7	6⅜ 7⅞	7½ 9½	8¾ 10½	7 10½	7½ 11	6¾ 9	6⅜ 9½	6 7⅜	5½ 6¾	4¾ 6½	4½ 6	4⅜ 5¾
Egypt'n	9½ 11	7¼ 8½	7 8½	7 8½	6½ 8¼	8 9½	7⅜ 8¾	8½ 9¼	12 12¼	15½ 16½	11¼ 14	11½ 16½	9 13	11½ 16½	10½ 12½	9½ 12	7 10	6 7½	6 8
Pernam.	11¼ 12½	10 11	8½ 9¼	7½ 8½	7¼ 8	7½ 8⅜	7 9	8¾ 9¾	9⅜ 11	12½ 14	10 13	10½ 13	9½ 11	8¾ 10	9 10¼	8½ 9	7 8¼	6½ 7½	5⅝ 6½
Maranh.	10⅜ 11¼	8¾ 9¾	7½ 8½	7½ 7¾	6⅜ 7	7 7⅜	6 7⅞	7⅜ 9½	8¾ 10½	11⅞ 13	10 12	9¾ 13	8½ 10	8 9¾	8 9¾	7½ 8½	6¼ 7½	5½ 6½	5½ 6¼
Demera.	10 12½	8 11	6¾ 9½	6¾ 9	5½ 8	6½ 9	6 9½	7½ 10½	8 11	11 15	10 14	10 14	8 13	8 13	9½ 11½	7½ 11	6½ 9½	6 8½	
W. India	8 9½	6½ 7½	6 7	6 7	5¼ 6½	6 7	5½ 6½	6½ 8½	7 8¾	7¾ 11	9 10¼	7 10¾			8 9	6 8	5¼ 6¾	5 6¼	4½ 5¾
Surat...	5½ 7	5 6½	3⅞ 5½	3½ 5	3 5½	4½ 5¾	3¼ 4¾	4¼ 6	5¼ 7⅝	6⅝ 8	6 8	3⅞ 7½	4½ 6½	5 6½	4½ 6	4 5¼	3½ 4¾	3½ 4½	3½ 4½

Extreme Prices of Upland Cotton in the market of Charleston.

Year.	Cents.	Year.	Cents.	Year.	Cents.	Year.	Cents.
1806	17 @23	1813	21 @30	1820	15 @20	1826	8 @14½
1807	16 22	1814	23 37	1821	14 18	1827	8 11
1808	10 14	1815	20 28	1822	11¾ 18½	1828	8 11½
1809	12 14	1816	23 32	1823	11½ 17	1829	7 10
1810	12 19	1817	25½ 35	1824	14 16½	1830	7½ 12½
1811	7 16	1818	25 35	1825	13½ 32	1831	6¼ 10¾
1812	8 10	1819	15 27				

TABLE IV....*East India Cotton imported into Europe from* 1832 *to* 1842, *inclusive.*

Year.	Bales.	Year.	Bales.	Year.	Bales.	Year.	Bales.
1832	149,285	1835	119,591	1838	111,314	1841	271,000
1833	100,878	1836	220,067	1839	137,581	1842	264,000
1834	93,921	1837	142,326	1840	226,000	1843	

South American Cotton imported into Europe from 1832 *to* 1842, *inclusive..*

Year.	Bales.	Year.	Bales.	Year.	Bales.	Year.	Bales.
1832	137,061	1835	179,043	1838	155,664	1841	99,000
1833	194,859	1836	185,154	1839	126,056	1842	103,000
1834	128,289	1837	138,697	1840	90,000	1843	

Egyptian Cotton imported into Europe from 1832 *to* 1842, *inclusive.*

Year.	Bales.	Year.	Bales.	Year.	Bales.	Year.	Bales.
1832	160,465	1835	140,956	1838	162,242	1841	123,000
1833	110,976	1836	180,301	1839	117,176	1842	108,000
1834	70,068	1837	158,400	1840	96,000	1843	

West India Cotton imported into Europe from 1822 *to* 1843, *inclusive.*

Year.	Bales	Year.	Bales.	Year.	Bales.	Year.	Bales.
1832	29,348	1835	59,297	1838	63,927	1841	75,000
1833	37,762	1836	87,450	1839	90,577	1842	70,000
1834	39,945	1837	79,874	1840	61,000	1843	

Imports of Cotton into France from 1822 *to* 1843, *both inclusive.*

Year.	Bales	Year.	Bales.	Year.	Bales	Year.	Bales.
1822	205,861	1828	206,132	1834	274,307	1839	342,100
1823	169,845	1829	242,230	1835	324,425	1840	466,318
1824	251,074	1830	282,752	1836	199,823	1841	458,851
1825	204,572	1831	218,393	1837	343,963	1842	442,470
1826	320,174	1832	269,159	1838	390,978	1843	399,165
1827	290,617	1833	305,633				

TABLE V....*Growth and Consumption of Cotton in the United States of America.*

	Growth. Bales.	Consumption. Bales.		Growth. Bales.	Consumption. Bales.
1826–27	937,000*	103,483	1835–36	1,360,725	236,733
1827–28	712,000	120,593	1836–37	1,422,930	222,540
1828–29	857,744	118,853	1837–38	1,801,497	246,063
1829–30	976,845	126,512	1838–39	1,360,532	276,018
1830–31	1,038,848	182,142	1839–40	2,177,835	295,193
1831–32	987,477	173,800	1840–41	1,634,945	297,288
1832–33	1,070,438	194,412	1841–42	1,683,574	267,850
1833–34	1,205,394	196,413	1842–43	2,379,460	325,714
1834–35	1,254,328	216,888			

* The estimate of the quantity taken for consumption does not include any Cotton manufactured in the States south and west of Virginia, nor any in that State, except in the vicinity of Petersburg and Richmond.

Growth of	1829–30.	1830–31.	1831–32.	1832–33.	1833–34.	1834–35.	1835–36.	1836–37.	1837–38.	1838–39.
New-Orleans	354,024	426,485	522,635	403,440	454,719	511,146	474,747	593,259	711,581	568,562
Natchez*							6,889	7,755	19,675	16,432
Florida	5,787	13,073	22,651	23,640	36,738	52,085	79,762	83,703	106,171	75,177
Alabama	102,684	113,186	125,921	129,370	149,978	197,692	236,715	232,243	309,807	251,742
Georgia	253,117	230,502	276,437	271,020	258,655	222,670	270,121	262,971	304,210	205,112
S. Carolina	188,871	185,166	173,872	181,880	227,359	203,166	231,237	196,377	294,334	210,171
N. Carolina	36,862	36,540	28,461	} 61,090	33,220	34,399	32,057	18,004	23,719	11,136
Virginia	35,500	33,895	37,500		44,725	33,170	29,197	28,618	32,000	22,200

* Included in the Exports from New-Orleans.

Stooling of Wheat.—Colonel North having had given him, two years since, some few grains of wheat, taken from an Egyptian Mummy, and supposed to be two thousand years old, placed it in the hands of Mr. Innes, his steward and head gardener at Roxton. Mr. Innes raised a small quantity, and this season planted the produce on about a third of a chain of ground, within the enclosure of the gardens, in rows at 18 inches apart, every grain being deposited singly at the distance of 9 inches from each other. On examination of the crop, it is found that from every grain has sprung upwards of 40 stems, every stem bearing an ear; on two stools taken at random, the number of stalks were 43 and 46. This great stooling of wheat is not a peculiarity of this Mummy wheat; it is known that the common English wheats, if cultivated with care on rich soils, and sown thin, will do the same: at King Sutton, this season, on land in the occupation of Mr. Colegrove, a small quantity of wheat being sown with tares, and the crop allowed to ripen, as many as fifty stems have been counted. [Banbury Guardian.

WOOL-GROWING AT THE SOUTH.

BY WILLIAM DARBY.

WASHINGTON, Oct. 20th, 1845.

To JOHN S. SKINNER, Esq:

Dear Sir—With no slight degree of pleasure, I received No. IV, (October, 1845,) of your "Farmers' Library," so too narrowly named. Such a work suits, more or less, all classes of society, and none more, if as much, as the legislator. Those who have to watch over and conserve the interests of all, ought to know the relative value, and what measures to adopt in order to give due legal and political attention to every separate interest. Your monthly Magazine, for such it is, has one inherent feature, which, to answer the great purposes I have stated, gives to it an inestimable value; that is, its being a common centre, where the experimental fruits of the highest minds are collected for universal use.

Your last number contains, with much other very interesting matter, two articles which may serve as texts to far more extended and developed views. These are, Whitemarsh B. Seabrook on the Cotton Plant; and the other, "A Review of the Past, Present, and Future State of the Wool Market."

Nothing can be more idle than disquisitions on the morality of extending the Domain of the United States over the wide, and by *man*, the almost unoccupied regions of Central North America. In all stages and aggregations of our species, from the Farm to the Empire, landed property is the sure inheritance of Industry, Energy and Frugality. This Law of Nature may, like all Laws, be opposed, but it is not to be repealed. It is now not much under half a century since I regarded the great central zone of North America as the sure inheritance of the Anglo-American. Time and circumstance have, and are, annually in combination, fulfilling and demonstrating the irresistible force of this law; but public knowledge of the consequences is very far from keeping pace with the reality of things.

Assuming therefore, what I have stated, as the inevitable destiny of the zone of North America, between N. Lat. 26° and 50°, if no farther south or north; then if so limited, the Anglo-American will spread over and possess on an area, not varying much from an equality, with all Europe, the regions of the earth best adapted to the production of the two species of Wool, the Animal and the Vegetable. From the Atlantic Ocean, as far westward as the experiments have been made, cotton of various textures, and on all soils admitting the growth of Indian corn, and as far north as 36°, can be abundantly produced. As the summers are longer, and winters shorter and milder, on the Pacific than on the Atlantic side of the continent, cotton no doubt can be produced on the West side many degrees farther north than on that of the east.

As to animal wool, its production admits, perhaps no limit, but Oceanic or some other water border, and millions on millions of acres of land, now regarded as waste, will be in less than another half century covered with flocks of the wool-bearing animals. This is not to me a new subject of thought, as in the Prairie section of Louisiana, more than forty years past, I have heard men of sense express their conviction of how admirably these grassy plains were adapted to the sheep. As soon as I can command time, I intend to forward for the 'Library,' a statistical article on the subjects merely glanced at at present.

Very sincerely, yours,
WILLIAM DARBY.

SAVE THE LEAVES.—At this season a great quantity of leaves may be readily gathered in many places. A rake used at the right time will gather them very fast by the sides of buildings and fences. They make excellent beds for cattle to lie on, and they are more valuable after such use than before. Rake all clean as soon as harvesting is over, and you will much increase your manure heaps.

As soon as the summer manure is scraped out of the cow-yard, leaves, litter, loam, sand, gravel, or peat mud may be spread over the yard. It costs less to do this than to buy guano or poudrette, and it will prove more useful, for you will be able to improve the texture of your soil if you exercise good judgment in choosing your materials.

Your gravelly manure will suit best your lowest or coldest grounds. Your sandy loads will do best on clayey soils. Your peat manure works quickest and best, on your gravelly knolls and sandy fields. It is quite important to consider well the use you are to make of your manures at the time when you are gathering the materials to increase your heaps; for in this way you alter gradually the very texture of your soil. You can render it more light and porous, or more compact and retentive of moisture. You can warm it, or cool it by means of the materials that you gather to be impregnated by the excrements of animals.

ON BREEDING HORSES....VALUE OF THE BRED HORSE.

BY A MAN OF EXPERIENCE.

OCTOBER 20th, 1845.

J. S. SKINNER, Esq.

Dear Sir:—Absence from home, and pressing business, have for some time prevented me from making a few crude remarks on your "Dissertation on HORSE BREEDING, and on the TROTTING HORSE of the United States," in the August number of the Farmers' Library: considering it decidedly the best article on that subject I have ever read, condensing much valuable information, drawn from the experience of the past; not only to the amateur of horses, but to breeders, a fund of information, which may correct many errors, and be a guide and valuable "text book" to refer to in judiciously breeding a most useful and profitable stock. Your Dissertation should be read over and over, and carefully reflected on, as it is well calculated to do away deep-rooted prejudices against Blood Horses, showing most conclusively that judicious crossing from them has in times past, and must for all time to come, continue to be the most profitable to the Breeders of that noble animal. And here let me remark that your "Library," so well calculated to disseminate useful knowledge to the Agriculturist and Breeders of Stock, should be extensively patronized, and found in every Family Library. Having for 30 years past had some experience in breeding of horses of various crosses, from the Blood Horse down to the "Norman or French," experience has taught me the value of the trite saying, "that nothing but the thorough-bred does it quite well." I admit, however, that about three-fourth bred answers for most purposes for the road, the farm, &c.; and in endeavoring to appreciate his great value to our common country, for a variety of purposes, not only for individual comfort, in conveying us where "steamboats and railroads cannot and will not take us;" also on our farms in Agricultural pursuits, the healthy and enlivening scenes of the chase—the course—and not least, in a national point of view, for Cavalry use, it is not easy to overrate their value; for an *army* with a weak or inefficient *Cavalry*, is like a "body without a soul." That Blood will *tell*, is just as sure as two and two make four: and here, Mr. Editor, let me remind you of an incident of the "Battle of Waterloo," where Bonaparte, in making his last tremendous struggle to retain the *Crown* of *France*, experienced and ruinously felt the great superiority of Blood Horses on which the English Cavalry were mounted. The battle raged, and victory, doubtful, seemed suspended between the two great contending *armies*; at this critical moment, the English Cavalry mounted on high bred horses, made their destructive charge, which resulted in the complete overthrow of the French, man and horse, the flower of his army; and the victors of an hundred battles were seen rolling in the dust, literally rode down. "Bonaparte at a small distance, on an eminence with his spy-glass, seeing the flower of his army, hitherto victorious, in agony exclaimed, 'See those horsemen, *those terrible horses!*'" Mark the expression, "*those terrible horses!*" And what was the lesson learned on this memorable occasion? Did not the "Allied Powers," France, Russia, Prussia, Austria, German States, Belgium, &c. &c. seeing the vast superiority of the bred horse, immediately establish Breeding Studs in a national point of view; and have been purchasing, at very great prices, from year to year, of England, where the Blood Horse has been kept pure for centuries past: to them a strong arm of defence, of wealth and of pleasure? And shall the people of the United States close their eyes to all the lights and evidence afforded by the experience of the past in the improvement of the breed of horses! Continue to breed from cold-blooded horses, and add to the number of thousands of worthless, impure, and basely adulterated horses, of no distinctive breed—"it is unwise and unprofitable."

In your remarks on Trotting Horses, several important queries to my mind are well established—1st. That generally a great performer has high strains, and traces directly to the "Blood Horse;" and here let me ask, where can we go for speed, bottom, and long continued endurance, but to the Blood Horse? "and echo answers, Where?" The great secret in breeding, is judicious crossing: which should be three-fourth bred from strong, powerful thorough-breds, like old Messenger or some of his valuable descendants, for roadsters, which can measure off their ten miles per hour: this I consider among the most valuable for common purposes: and my word for it, the trotting gentry will select more flyers from this than any other cross. Deliver me from the cross of the "*French*" or Canadian, or Norman breed: I have tried them to my sorrow and disadvantage, and promise to do so no

more. I admit that crossing the Blood Horse on the French mares, will improve the French, but detracts and deteriorates in the same ratio from pure blood; such at least, has been my experience: And he who attempts to breed trotters by crossing their mares with French or half French studs, even if from long training, they have been made to trot their mile in three minutes, as all their hand-bills will attest, will find in "nineteen cases out of twenty," it will prove a total failure, for this clear reason—they are of no distinctive breed. 2d. That a trotting horse, to excel, must do nothing but trot; and his size, as appears from your statement, from 15 to 16 hands high, have excelled; and last, and not least, it is superior skill, and long continued training and driving for years, that makes the trotting horse, when crossed with high strains of blood, altogether superior in the United States.

Would not breeders, therefore, do well to examine carefully into this important subject, discard long established prejudices, and adopt that course of breeding, which shall not only prove the most useful and profitable, but also, as we journey along through life, have the satisfaction of endeavoring to do some little good for our common country.

Yours, most respectfully, L.

THE PENNIMAN GRASS.

From the north side of Cuba—good for soiling, for pasturage, and for hay.

We have not now to suggest for the first time, but now earnestly repeat the intimation, that the *name* of the person bringing to or importing for his country, a new grass, grain, animal, vegetable, tree—either fruit or ornamental—ought to be given to the thing thus added to the list of things calculated to enrich or embellish the land. Hence we baptize the Grass, the seed of which was received with the following letter, the *Penniman Grass.* The quantity was small, and has all been distributed.

New-York, Oct. 25, 1845.

Dear Sir:—I hand you with this, a small parcel of grass seed, sown on the north side of the Island of Cuba. My brother, who resided for some time on the Island, noticed the great length to which the grass grew; (of which the seed herewith is the product,) being upwards of six feet in length; upon inquiry, respecting it, he found it afforded an excellent feed as grass to the cattle, and made the best of hay when cured—growing thick, and heading out like the best of English grass with us. Thinking it might do well in our climate and soil, he was induced to gather a quantity of the seed, which he has disposed of in the New-England States, save the small parcel I now hand you.

I have seen some of this grass, which my brother brought home with him, measuring in length upwards of seven feet; every joint quite as tender, cured, as our best English hay. You will be struck with the length of this seed, bearing as it does, a proportion to the length of grass it produces. Be pleased to present the package to some of your farming friends. Perhaps it may be the means of adding a joint or two more to the fine grasses of America; if so, I shall be truly glad, for "behold how large a stalk this little seed bringeth forth."

Yours, respectfully,
BENJ. F. PENNIMAN.
No. 89 Broad-street.

To Mr. Skinner, Editor of the Farmers' Library.

REFLECTIONS ON AGRICULTURAL PROGRESS.

Oswego, Nov. 1, 1845.

Dear Sir: Having been among the first to have the "Farmers' Library" introduced here, I applied to one of our best agents, by whom I have been supplied with all of the numbers, and am thoroughly convinced of its merits and utility.

It is but a few short years since I saw, not many miles from your City, farmers allowing nearly all of their manure to go to waste: what little was gathered not being of much profit, for it had been reduced by the action of the air for a year or so before using; together with the advantage of descending ground in many places so as to have a dry yard, &c.; but not only manuring but the idea of deep plowing was wholly objected to. Some argued that it injured the soil and that nothing would grow upon it for a length of time afterwards. Others thought the orchard must not be trimmed and a reason for that was given thus: Some seasons there were blighting winds, and if the trees were deprived of many branches the winds would destroy all the fruit and so a thick, branchy tree would be better protected against the elements, and produce fruit from the middle and protected parts. But after all few of those trees are to be seen and little or none of the fruit is found in our markets.

It is gratifying to see now, on the same farms, the fine grafted trees with splendid fruit taking the place of the natural and uncultivated, while the plow is doing wonders, not spoiling the land, as was once thought, by going too deep, but actually renovating worn-out lands. What a contrast in opinion, producing changes in almost every thing!

Now in many of those same farms that the occupants worked in the old and more than slovenly way, you may see the manure taken care of the tillage altogether different, and I will venture to say that more is produced, of a better quality and on less land, with less labor,

than formerly; but still there is room for improvement. It is said that, as a nation, our march is onward: and if so let us march on rejoicing and improving, for nothing seemed to need improvement more than our social and agricultural systems. The main root of the evil has lain in the false notion that labor was not honorable, and therefore men of science have stood back or pursued what are most commonly called learned professions, which the world is too full of. But now, thanks to the men of eminence who have turned to the Plow, it truly is the right way to make labor honorable:—and I may now ask why labor was ever considered otherwise than the most honorable way for man to live, as our very natures demand the labor of our hands for our health, as well as for sustenance. Let us all scout the idea of labor being dishonorable, and our poor-houses and prisons will soon be vacant. As we are creatures of imitation it is but natural that we should follow our leaders; it is so in religion and politics, and why not in our social and agricultural affairs?—Many of the farmers here are behind the times too much. Land is merely run over, not cultivated. and lean crops and loss of labor are the consequences. Now, nothing seems more likely to bring about the right system than free discussion, and as the "Farmers' Library" is filled with the right sort, let it pass round.—When I was a lad an old gardener gave me this advice, which I have ever found true: If I would raise long parsnips, I must dig the ground deep and manure well!

Yours truly, in pursuit of more light,

JOHN S. SKINNER, Esq. L. D.

EDUCATION IN VIRGINIA.

REMARKS ON EDUCATION INTENDED FOR GENERAL APPLICATION.

No sign in the moral and political horoscope has given us so much pleasure, as the apparent determination, in Virginia to apply the powers of the government, and the resources of that glorious old commonwealth, to the *better and more general education of the people.* True, no State can boast more brilliant orators. She possesses a great number of well educated men. Mental indolence is not the characteristic of a Virginia gentleman; but they have given their minds too much to *party* conflicts. For the political arena she carries cocks under both arms, ready trained and healed for the pit, let that be opened where it may, with champions to give them a wing whenever they are cut down.—She will stickle for "the ninth part of a hair," on the subject of State rights, and gallantly fight for Texas or for Oregon; but in population, in internal improvements, in agricultural wealth; and in political power, incident to these, what progress has she made? where does she stand? Steam, which in so many places does the work of millions of men, and creates millions of wealth.—to what account is she turning it?—Does it spin her wool, or grind her grain, or lift her coal, or forge her iron, or "whirl the rapid car" over her mountains or into her mountain valleys to bring her internal resources—so various—so inexhaustible, into available markets?

And do not these views raise the question whether the public mind does not need to be turned in some *more useful direction?* whether the system of education is not defective, either in its nature or in being too much restricted, or both? For her warmest friends, and we claim to be of that category, it is consoling however to know—(can we venture to say *know*, or must we say *hope*) that her strong men of all parties, are manifesting a determination to look with one heart and one feeling into her condition and resources—physical and mental—and to pass the *probe to the bottom* of the evils that have retarded her growth, and held her back in the race of power and of glory? For if glory is to be predicated of States, in what does it consist? Is it not in general and efficient intellectual culture—in sagacity and resolution to make the most of its resources,—in hospitality and the love of liberty and justice! What right minded, well instructed citizen does not feel ambitious to maintain the rights and fair fame of his *own State*, next after that of his own family?—Who has the heart and the just pride of a man that would not blush at being born the inheritor of the dishonor that is the portion of any State steeped in ignorance, neglectful of its natural advantages, lagging in the rear of *all* its cotemporaries in all that gives respectability, power and security to States and nations? and above all, but we will not name it in connection with Virginia—we were going to say *stained with repudiation*! No community that ever existed has been more jealous of its honor—

more observant of its faith than she—and if ever men existed, with talents capable of descerning and obviating what may have been improvident or short-sighted or paralyzing in her legislative policy, such men are the sons of the old Dominion. Any calm observer beyond her borders may see that her strong men are now beginning to think, and to come together for her intellectual and physical improvement. It is not now a mere play of the zephyr on the surface of the waters. It is not the momentary agitation of a stagnant pool by a gust of wind—no let us hope that living springs are boiling up from the bottom, that will vivify and purify and give activity to the mass and secure a perennial flow of wholesome waters that will irrigate and fructify the whole commonwealth. Yes, and pray God for a wholesome direction to the public mind—for with such men and with such interests at stake, "*where there is a will there is a way,*"—we trust in heaven that the result will tend to give its proper preponderance to the agricultural interest in the future councils and legislative action of the State. That the sons of the soil may be educated, not as *partisan politicians* and demagogues of an hour, but as men capable of understanding and ready to maintain her *landed interest*. Let those to whom the work of projecting a system of general education is entrusted, procure at once and and read the several Reports of the Superintendents of the Common Schools in New-York and other States. "The Common School System, by S. S. RANDALL," and the several Reports, the last being the *eighth*, of the Board of Education of the State of Massachusetts—and tho' last by no means the least, let them procure the Educational Journal conducted by the Secretary of the Board. "As a repository of the Reports of the Board and of the Secretary and as a vehicle for the communication and dissemination of the views of *practical* teachers, in reference to modes of instruction, it is an invaluable work for persons employed in teaching, and should be in the hands of every one who wishes well to the physical the moral and the intellectual education of his family."

It has been and will continue to be a matter of heartfelt solicitude with the editor of the FARMERS' LIBRARY, to make it such a work as *ought to be in the hands of every young man, and in the library of every country school in the United States*; and we feel authorized to say that School Libraries will be furnished with copies at the wholesale price.

We should never tire of writing on this subject as long as we could hope to assist in achievement of the great object—universal *practical* instruction—but pressed now for time and space, we adopt for the expression of what we would say in conclusion, the following extract from the last number of the Quarterly Journal of Agriculture.

Again, a more thorough education for those who till the ground, than has hitherto been contemplated, seems especially demanded, to enable them to avail themselves of the discoveries of modern science. This, however, is a position which many are now ready to take, although its importance cannot be so well appreciated by those who are placed upon the very rich soils of our country; but those who are tilling soils already exhausted of their natural fertility, see the necessity, and would see it still better, if they could not sell or exchange their farms for the new and exuberantly rich lands of the west.

Leaving this point as it is, we remark once more, that the times and the circumstances of our country require more than ever the cultivation of the minds of this great class of the citizens of our Republic. It was safe in the morning of our country, when oppression taught our fathers the value and the price of liberty, for the husbandman and mechanic to commit most of the duties incident to office to those who were by their profession allied to a public life. But now in this age, it appears to us, that to the owners and cultivators of the soil should more especially be committed this trust, as they have a paramount interest in the affairs of the State and nation. They who are withdrawn from the sinister influences of a dense city population, where the unworthy and the demagogues of the land are wont to congregate,* should now stand up in the halls of legislation and justice, and at least possess themselves of that power to which their numbers entitle them. Some may sneer at the expression, but to us it is plain, that, to the cultivators of the soil is committed the destinies of this country; that to them more especially is committed the great duty of handing down, unimpaired, our institutions to posterity. If this is true, it follows that the intellectual faculties should receive that share of culture which is contended for in this our essay.

We would not by any means be understood, in these remarks, to say that farmers are to become politicians, in the odious sense of the phrase. We mean only that they should understand as much of history, of law and of legislation, and of rights as they are defined in our constitution, as shall enable them to stand up by the side of our professional men, and to encounter successfully the demagogues and party hacks which in these days seem to swarm and multiply out of all proportion to the rest of society.—Who, of all our citizens, are so well prepared to act dispassionately and rightly, as those who

* [Demagogues are not the peculiar growth of cities—as the vermin that feed on the beggar are bred in his own filth, so demagogues are the growth of the *ignorance* of communities, who hatch out and support them—sound and widely diffused education will extirpate them, as clear culture extirpates loathsome weeds. "Dense city populations" have their advantages as well as disadvantages. It is in them that sharper conflicts of the mind, and easier communication of and access to all modern discoveries strike out new ones. They are, too, the Emporiums of Commerce, the great promoter of discovery and civilization. No nation can reach to great elevation in power and glory and liberty and security as long as it is *politically*, priest ridden. *Ed. Farm. Lib.*]

are located at a distance from the hot-beds of party spirit in our cities, and upon a microscopic scale in our villages; as those who quietly plow their fields and gather their harvests?—But ignorant men are not fit for responsible posts: it is not the mere tiller of the soil, the untutored laborer, but it is the enlightened workman, the educated farmer, to whom we would commit our great interests: to the plain and unsophisticated but not uninstructed, sons of the soil, unskilled it may be in intrigue, but who, when they march up to duty, when they exercise their own personal rights, or act on behalf of their fellow citizens by a delegated power, do it without fear, though frowned upon by the scheming partisan and the ambitious office-seeker.

To conclude, we declare that we care not how many institutions are founded, by what name they may be known, or when or by whom our young men are educated, *provided it is done;* but let not our farmers deceive themselves by founding institutions whose objects are partial and narrow, and which leave out of view those courses of study which are necessary to fit the pupil for the discharge of the duties of a citizen of this republic.

POTATO STARCH....HOW PREPARED.

EVERYTHING is interesting which relates to the culture, uses and economy of a root on which so much labor is bestowed over so wide a range of the civilized world, and which, far beyond all others, forms an element of human subsistence. So great has been the dependence upon it that well-founded alarm exists in Europe, lest the failure of the crop this year may produce a famine; and our bread-stuffs already begin to show the effect of the *Potato Murrain* there. If Humanity could have its proper sway, in opposition to the cunning policy of monopolists of the wealth and power of nations, the restrictions devised for their sinister purposes would be repealed, and our Indian corn and other bread-stuffs would find their way and spread abundance over lands that are threatened with the diseases and the mortality that ever follow in the train of starvation.

Without adverting farther, however, to the peculiar circumstances which must at this time enhance the importance of this root in the eyes of the agriculturist, we should deem the following worthy of a place, as an item of information, which will serve to give *variety to the assortment* that every gentleman agriculturist ought to possess; for we hope our readers have already discovered and approved our design, to go for the curious and the ornamental, as well as the useful and the money-making. We hope the time has arrived when young gentlemen in the country, as well as do cultivated and professional men in the towns, will, in regard to their reading, and researches, and intellectual exercises, begin to ask themselves some other question beside that very useful—but, when pushed too far, very vulgar one—*how much money will this put in my pocket?* The extract is from that profound work to which we have before referred—Dr. Kane on the Industrial Resources of Ireland:

"Of all the starch-bearing plants, the potato is that which affords the greatest quantity of produce from a given surface of land. The different varieties of potato differ, however, very much; and the following table will indicate exactly the circumstances of the most important kinds. The plants were grown all on the same quality of land, and the analyses are by Payen, the eminent French agricultural chemist.

Varieties.	*1 cwt. seed produced*	*1 statute acre produced*	*100 parts contained*		
			Water.	*Starch.*	*Gluten & fibre.*
Rohan, ...	58 cwt	14½ tons	75.2	16.6	8.2
Large yellow,	37 "	9½ "	68.7	23.3	8.0
Scotch.....	32 "	8 "	69.8	22.0	8.2
Slow Island..	56 "	14 "	79.4	12.3	8.3
Legonzac, ...	32 "	8 "	71.2	20.5	8.3
Siberian, ...	40 "	10 "	77.8	14.0	8.2
Duvillers,....	40 "	10 "	78.3	13.6	8.1

These results show that the quantity of starch is not largest necessarily in those varieties which yield the greatest weight of tubers. Thus an acre of large yellow potatoes, which gives but 9½ tons of tubers, produces two tons, three cwt. of starch, whilst the acre of Slow Island potatoes, which produce fourteen tons of tubers, give only one ton, fifteen cwt. of starch. In cultivating the plant for the purpose of extracting this material, it is, therefore, of the greatest importance to attend to the existence of these varieties.

The preparation of starch from the potato is an operation of very simple kind, and well adapted for the industry of the smaller towns, where potatoes would be usually cheap. It requires only the most ordinary skill, and involves little machinery, the greatest nicety in it being perfect cleanliness, and care that the washings be well finished and with pure water. The operations of the manufacture are

1st. Washing the tubers.
2d. Rasping them toa pulp.
3d. Pressing the pulp.
4th. Washing the rough starch.
5th. Draining and drying the produce.
6th. Bolting and storing.

Of these operations it is only necessary to notice one or two in detail.

The breaking up of the tubers into a pulp is accomplished by means of cutting cylinders, to which the potatoes are supplied from a hopper, nearly as grain is to a mill. The more rapidly the cutters move, the finer is the pulp produced, and the more perfect the subsequent extraction of the starch, and hence they generally make 600 to 900 turns in the minute, and as these cylinders are usually about twenty inches in diameter, their periphery moves with a velocity of from 1000 to 1500 yards in a minute. A single cylinder of the above dimensions, and of sixteen inches long, making 800 revolutions in a minute, will reduce to pulp about fifty bushels of potatoes per hour. This for the twelve working hours is about ten tons.

The object of pressing or sifting the pulp is to separate the fecula from all foreign substances, especially from the cellular tissue, which, being coarser, rests on the scive through which the fine starch passes. A great variety of mechanical arrangements have been constructed for this purpose, which fulfil their object, but there remains always with the residual pulp 2 or 3 per cent. of the fecula, which it is impossible to obtain.

The starch, diffused in the current of water by which it has been washed out from the pulp, is run into vats, where it is poured off, and fresh water put on: finally the starch is taken out and dried on floors. As it consolidates into very firm masses, it requires finally to be broken down by a kind of bolting machine, before being put up for sale.

It is necessary to add some valuation of the money circumstances of this manufacture. An acre of potatoes, very well manured, and on good land, may be considered to produce nine tons of potatoes, which may be taken as worth £15. From such potatoes it may be expected, that, with proper care, 15 per cent. of pure starch may be extracted, and hence, from the 9 tons, 27 cwt. The market price of the potato starch is variable; it has been 30s. per cwt., but it only on rare occasions falls below 20s. Taking it at 20s. the value of the produce of the acre becomes £27, leaving for cost of manufacture and profit £12, and of this certainly a large proportion should be profit. I do not think I value the potatoes too low, as, of course, the manufacturer, if not himself the grower, would purchase for store at proper seasons, and avail himself of the lowest terms.

But this calculation of advantage supposes the starch to be the only valuable matter extracted from the potato, which is far from being the case. The residual pulp, which, when perfectly dry, amounts to about 5 per cent. of the entire weight of the tubers, has been found a most nourishing food; in fact, it contains most of the nutritious part of the root, the mere starch which was removed being comparatively much less important in nutrition. This pulp, if moist, putrefies rapidly, it is rich in nitrogen, and in fact analogous to animal substances in composition, and, consequently, if not required for food would form, by being made with lime and clay into a compost, a manure of great value, and especially suitable for restoring to the potato ground the substances which the crop in growing had removed. The waters with which the pulp is first washed, dissolve a quantity of the soluble constituents of the potato. They rapidly putrefy, and exhale an odor so rotten as to have rendered the starch factories near Paris a nuisance to the neighborhood, until it was suggested to employ this water as a manure, which has been perfectly successful, and at once removed an important drawback to this branch of industry, and materially increased the fertility of the surrounding farms.

If these residues be properly economized, it is evident that the cost of growing the potatoes may be materially diminished. The atmosphere, in itself, furnishes in fact the carbonic acid and water from which the starch is formed, and if the matters taken from the soil in each crop, be returned to it in the residues of the manufacture, the cost of manure, so heavy for this particular plant, may be almost entirely obviated.

In this country, where the extensive use and culture of the potato have become almost a national characteristic; where labor not requiring considerable skill is to be had so cheap; where potatoes are at their minimum price; it is not merely to be regretted but absolutely disgraceful to ourselves, that we import from Scotland and from France, large quantities of the potato starch to be consumed in Ireland.

The starch is not the only material extracted from potatoes, and extensively available in the arts. The potato itself, reduced to flour, is at present extensively employed upon the Continent in the preparation of a very wholesome quality of bread, and the starch itself is consumed in making confectionary, jellies, sago, tapioca, in thickening paper, and in a variety of uses, by which such quantities of it are employed as to render its manufacture a really important and extensive department of industry. The most remarkable of all the applications of potato starch is, however, one to which the excise laws of this country would probably present invincible impediments. It is the preparation of sugar and of spirits. Under the influence of certain chemical agents, simple, yet peculiar in their action, and to which it would be my province here to refer in detail, starch is converted into sugar, and this sugar, by fermentation, yields spirits. On the Continent the manufacture of spirit from corn is almost abandoned. Potato spirit is almost universally used; and in flavor it so resembles brandy, that it is well known that a large quantity of the French brandy brought into London, is potato spirit from Hamburgh, colored with burned sugar."

☞ Mr. Bland, of Ripon, has an apple tree in his garden which has blossomed thrice this year. There are now upon it two crops of apples, and the blossoms for a third have just set. [English Paper.

☞ The *London Times* estimates the capital of seventy-four railways completed, or in course of completion, at £103,166,220—of projected branches of these, at £35,000,000, and of 707 new companies, either established or projected up to date, at £464,698,656—making a total of £602,864,876!

☞ The system of smuggling by means of dogs is represented by the Valenciennes journals to be still carried on with unabated activity. A few days ago ten dogs, laden with tobacco, and two men who had the direction of them, were caught by the officers of the customs at Alescon. [English Paper.

THE INCLINED PLANE AND WEDGE.

From Dr. Dion. Lardner's Lectures, now in course of publication by Greeley & McElrath of New-York.

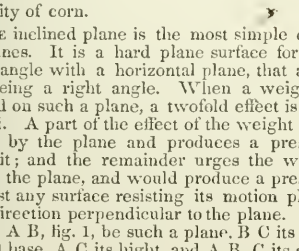
ALTHOUGH the connection between these two mechanical powers and practical Agriculture, may not be apparent at first sight, let the reader say, after perusal, whether any young man ought to be, and be satisfied to remain, ignorant of such matters, whose very business every day requires the practical use of contrivances by which he is enabled, at so little expense, to make vast additions to the animal power at his command? So it may be said of the lever and the pulley which shall be in like manner clearly explained in our next, from the same luminous author.

Thus do we proceed to demonstrate that we have many things in store for the accomplishment of young Agriculturists, besides telling them how much a hog of a favorite breed may be made to weigh in a given time on a given quantity of corn.

THE inclined plane is the most simple of all machines. It is a hard plane surface forming some angle with a horizontal plane, that angle not being a right angle. When a weight is placed on such a plane, a twofold effect is produced. A part of the effect of the weight is resisted by the plane and produces a pressure upon it; and the remainder urges the weight down the plane, and would produce a pressure against any surface resisting its motion placed in a direction perpendicular to the plane.

Let A B, fig. 1, be such a plane, B C its horizontal base, A C its hight, and A B C its angle of elevation. Let W be a weight placed upon

Fig.1.



it. This weight acts in the vertical direction W D, and is equivalent to two forces—W F perpendicular to the plane, and W E directed down the plane. If a plane be placed at right angles to the inclined plane below W, it will resist the descent of the weight, and sustain a pressure expressed by W E. Thus, the weight W resting in the corner, instead of producing one pressure in the direction W D, will produce two pressures: one expressed by W F upon the inclined plane, and the other expressed by W E upon the resisting plane. These pressures respectively have the same proportion to the entire weight as W F and W E have to W D, or as D E and W E have to W D, because D E is equal to W F. Now the triangle W E D is in all respects similar to the triangle A B C, the one differing from the other only in the scale on which it is constructed. Therefore the three lines A C, C B, and B A, are in the same proportion to each other as the lines W E, E D, and W D. Hence A B has to A C the same proportion as the whole weight has to the pressure directed toward B, and A B has to B C the same proportion as the whole weight has to the pressure on the inclined plane.

We have here supposed the weight to be sustained upon the inclined plane, by a hard plane fixed at right angles to it. But the power necessary to sustain the weight will be the same, in whatever way it is applied, provided it act in the direction of the plane. Thus a cord may be attached to the weight, and stretched toward A, or the hands of men may be applied to the weight below it, so as to resist its descent toward B. But in whatever way it be applied, the amount of the power will be determined in the same manner. Suppose the weight to consist of as many pounds as there are inches in A B, then the power requisite to sustain it upon the plane will consist of as many pounds as there are inches in A C, and the pressure on the plane will amount to as many pounds as there are inches in B C.

From what has been stated, it may easily be inferred that the less the elevation of the plane is, the less will be the power requisite to sustain a given weight upon it, and the greater will be the pressure upon it. Suppose the inclined plane A B to turn upon a hinge at B, and to be depressed so that its angle of elevation shall be diminished, it is evident that as this angle decreases, the hight of the plane decreases, and its base increases. Thus, when it takes the position B A′, the hight A′ C′ is less than the former hight A C, while the base B C′ is greater than the former base B C. The power requisite to support the weight upon the plane in the position B A′ is represented by A′ C′, and is as much less than the power requisite to sustain it upon the plane A B, as the hight A′ C′ is less than the hight A C. On the other hand, the pressure upon the plane in the position B A′ is as much greater than the pressure upon the plane B A, as the base B C′ is greater than the base B C.

The power of an inclined plane, considered as a machine, is therefore estimated by the proportion which the length bears to the hight. This power is always increased by diminishing the elevation of the plane.

Roads which are not level may be regarded as inclined planes, and loads drawn upon them in carriages, considered in reference to the powers which impel them, are subject to all the conditions which have been established for inclined planes. The inclination of the road is estimated by the hight corresponding to some proposed length. Thus it is said to rise one foot in fifteen, one foot in twenty, &c., meaning that if fifteen or twenty feet of the road be taken as the length of an inclined plane, such as A B, the corresponding hight will be one foot. Or the same may be expressed thus: that if fifteen or twen-

ty feet be measured upon the road, the difference of the levels of the two extremities of the distance measured is one foot. According to this method of estimating the inclination of the roads, the power requisite to sustain a load upon them (setting aside the effect of friction) is always proportional to that elevation. Thus, if a road rise one foot in twenty, a power of one ton will be sufficient to sustain twenty tons, and so on.

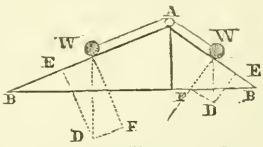
On a horizontal plane, the only resistance which the power has to overcome, is the friction of the load with the plane, and the consideration of this being for the present omitted, a weight once put in motion would continue moving forever, without any farther action of the power. But if the plane be inclined, the power will be expended in raising the weight through the perpendicular height of the plane. Thus, in a road which rises one foot in ten, the power is expended in raising the weight through one perpendicular foot for every ten feet of the road over which it is moved. As the expenditure of power depends upon the rate at which the weight is raised perpendicularly, it is evident that the greater the inclination of the road is, the slower the motion must be with the same force. If the energy of the power be such as to raise the weight at the rate of one foot per minute, the weight may be moved in each minute through that length of the road which corresponds to a rise of one foot. Thus if two roads rise, one at the rate of a foot in fifteen feet, and the other at the rate of one foot in twenty feet, the same expenditure of power will move the weight through fifteen feet of the one, and twenty feet of the other at the same rate.

From such considerations as these, it will readily appear that it may often be more expedient to carry a road through a circuitous route than to continue it in the most direct course; for, though the measured length of the road may be considerably greater in the former case, yet more may be gained in speed with the same expenditure of power, than is lost by the increase of distance. By attending to these circumstances, modern road-makers have greatly facilitated and expedited the intercourse between distant places.

If the power act oblique to the plane, it will have a twofold effect: a part being expended in supporting or drawing the weight, and a part in diminishing or increasing the pressure upon the plane. Let W P, fig. 1, be the power. This will be equivalent to two forces, W F′, perpendicular to the plane, and W E′, in the direction of the plane. In order that the power should sustain the weight, it is necessary that that part W E′ of the power which acts in the direction of the plane, should be equal to that part W E, fig. 1, of the weight which acts down the plane. The other part W F, of the power acting perpendicular to the plane, is immediately opposed to that part W F of the weight which produces pressure. The pressure upon the plane will therefore be diminished by the amount of W F′. The amount of the power, which will equilibrate with the weight, may, in this case, be found as follows: Take W E′ equal to W E, and draw E′ P perpendicular to the plane, and meeting the direction of the power. The proportion of the power to the weight will be that of W P to W D. And the proportion of the pressure to the weight will be that of the difference between W F and W F′ to W D. If the amount of the power have a less proportion to the weight than W P has to W D, it will not support the body on the plane, but will allow it to descend. And if it had a greater proportion, it will draw the weight up the plane toward A.

It sometimes happens that a weight upon one inclined plane is raised or supported by another weight upon another inclined plane. Thus, if A B and A B′, fig. 2, be two inclined planes, forming an angle at A, and W W′ be two weights placed upon these planes, and connected by a cord passing over a pulley at A, the one weight will either sustain the other, or one will descend, drawing the other up. To determine the circumstances under which these effects will ensue, draw the lines W D and W′ D′ in the vertical direction, and take upon them as many inches as there are ounces in the weights respectively. W D and W′ D′ being the lengths thus taken, and therefore representing the weights, the lines W E and W′ E′ will represent the effects of these weights respectively down the planes. If W E and W′ E′ be equal, the weights will sustain each other without motion. But if W E be greater than W′ E′, the weight W will descend, drawing the weight W′ up. And if W′ E′ be greater than W E, the weight W′ will descend drawing the weight W up. In every case, the lines W F and W′ F′ will represent the pressures upon the planes respectively.

Fig. 2.



It is not necessary for the effect just described, that the inclined planes should, as represented in the figure, form an angle with each other. They may be parallel, or in any other position, the rope being carried over a sufficient number of wheels placed so as to give it the necessary deflection. This method of moving loads is frequently applied in great public works where rail roads are used. Loaded wagons descend one inclined plane, while other wagons, either empty or so loaded as to permit the descent of those with which they are connected, are drawn up the other.

In the application of the inclined plane, which we have hitherto noticed, the machine itself is supposed to be fixed in its position, while the weight or load is moved upon it.—But it frequently happens that resistances are to be overcome which do not admit to be thus moved. In such cases, instead of moving the load upon the plane, the plane is to be moved under or against the load. Let D E, fig. 3, be a heavy beam secured in a vertical position between guides, F G and H I, so that it is free to move upward or downward, but not laterally. Let A B C be an inclined plane, the extremity of which is placed beneath the end of the beam. A force applied to the back of this plane A C, in the direction C B, will urge the plane under the beam, so as to raise the beam to the position represented in

Fig. 3.

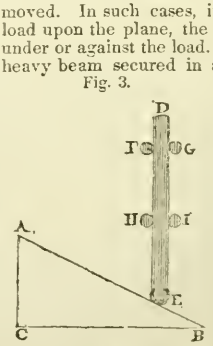
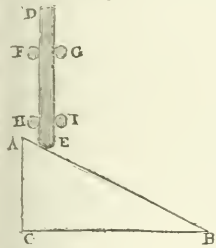


fig. 4. Thus, while the inclined plane is moved through the distance C B, the beam is raised through the hight C A.

Fig. 4.



When the inclined plane is applied in this manner, it is called a *wedge*.—And if the power applied to the back were a continued pressure, its proportion to the weight would be that of A C to C B. It follows, therefore, that the more acute the angle B is, the more powerful will be the wedge.

In some cases the wedge is formed of two inclined planes, placed base to base, as represented in fig.5. The theoretical estimation of the power of this machine is not applicable in practice with any degree of accuracy. This is in part owing to the enormous proportion which the friction in most cases bears to the theoretical value of the power, but still more to the nature of the power generally used. The force of a blow is of a nature so wholly different from continued forces, such as the pressure of weights, or the resistance offered by the cohesion of bodies, that they admit of no numerical comparison. Hence we cannot properly state the proportion which the force of a plow bears to the amount of a weight or resistance. The wedge is almost invariably urged by percussion, while the resistances which it has to overcome are as constantly forces of the other kind. Although, however, no exact numerical comparison can be made, yet it may be stated in a general way that the wedge is more and more powerful as its angle is more acute.

Fig. 5.

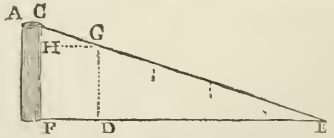
In the arts and manufacturers, wedges are used where enormous force is to be exerted through a very small space. Thus it is resorted to for splitting masses of timber or stone. Ships are raised in docks by wedges driven under their keels. The wedge is the principal agent in the oil-mill. The seeds from which the oil is to be extracted are introduced into hair bags, and placed between planes of hard wood.—Wedges inserted between the bags are driven by allowing heavy beams to fall on them. The pressure thus excited is so intense, that the seeds in the bags are formed into a mass nearly as solid as wood. Instances have occurred in which the wedge has been used to restore a tottering edifice to its perpendicular position. All cutting and piercing instruments, such as knives, razors, scissors, chisels, &c., nails, pins, needles, awls, &c., are wedges. The angle of the wedge, in these cases, is more or less acute, according to the purpose to which it is to be applied. In determining this, two things are to be considered—the mechanical power, which is increased by diminishing the angle of the wedge, and the strength of the tool, which is always diminished by the same cause. There is, therefore, a practical limit to the increase of the power, and that degree of sharpness only is to be given to the tool which is consistent with the strength requisite for the purpose to which it is to be applied. In tools intended for cutting wood, the angle is generally about 30°. For iron, it is from 50° to 60°, and for brass, from 80° to 90°. Tools which act by pressure may be made more acute than those which are driven by a blow; and, in general, the softer and more yielding the substance to be divided is, and the less the power required to act upon it, the more acute the wedge may be constructed.

In many cases the utility of the wedge depends on that which is entirely omitted in its theory, viz., the friction which arises between its surface and the substance which it divides. This is the case when pins, bolts, or nails, are used for binding the parts of structures together; in which case, were it not for the friction, they would recoil from their places, and fail to produce the desired effect. Even when the wedge is used as a mechanical engine, the presence of friction is absolutely indispensable to its practical utility. The power, as has already been stated, generally acts by successive blows, and is therefore subject to constant intermission, and, but for the friction, the wedge would recoil between the intervals of the blows with as much force as it had been driven forward.—Thus the object of the labor would be continually frustrated. The friction, in this case, is of the same use as a ratchet-wheel, but is much more necessary, as the power applied to the wedge is more liable to intermission than in the cases where ratchet-wheels are generally used.

When a road directly ascends the side of a hill, it is to be considered as an inclined plane; but it will not lose its mechanical character, if, instead of directly ascending toward the top of the hill, it winds successively round it, and gradually ascends, so as, after several revolutions, to reach the top. In the same manner a path may be conceived to surround a pillar, by which the ascent may be facilitated upon the principle of the inclined plane. Winding stairs constructed in the interior of great columns partake of this character; for although the ascent be produced by successive steps, yet if a floor could be made sufficiently rough to prevent the feet from slipping, the ascent would be accomplished with equal facility. In such a case, the winding path would be equivalent to an inclined plane, bent into such a form as to accommodate it to the peculiar circumstances in which it would be required to be used. It will not be difficult to trace the resemblance between such an adaptation of the inclined plane and the appearances presented by the thread of a *screw*; and it may hence be easily understood that a screw is nothing more than an inclined plane constructed upon the surface of a cylinder.

This will perhaps be more apparent by the following contrivance: Let A B, fig. 6, be a common round ruler, and let C D E be a piece of white paper cut in the form of an inclined.

Fig. 6.



plane, whose hight C D is equal to the length of the ruler A B, and let the edge C E of the paper be marked with a broad black line: let the

edge C D be applied to the ruler A B, and, being attached thereto, let the paper be rolled round the ruler; the ruler will then present the appearance of a screw, fig. 7, the thread of the screw being marked by the black line C E, winding continually round the ruler. Let D F, fig. 6, be equal to the circumference of the ruler, and draw F G parallel to D C, and G H parallel to D E, the part C G F D of the paper will exactly surround the ruler once; the part C G will form one spire of the thread, and may be considered as the length of one inclined plane surrounding the cylinder, C H being the corresponding hight, and G H the base. The power of the screw does not, as in the ordinary cases of the inclined plane, act parallel to the plane or thread, but at right angles to the length of the cylinder A B, or, what is to the same effect, parallel to the base H G; therefore the proportion of the power to the weight will be, according to principles already explained, the same as that of C H to the space through which the power moves parallel to H G in one revolution of the screw. H C is evidently the distance between the successive positions of the thread as it winds round the cylinder; and it appears, from what has been just stated, that the loss this distance is, or in other words, the finer the thread is, the more powerful the machine will be.

Fig. 7

☞ The action of the Screw will be illustrated in our next.

PEA CULTURE IN THE SOUTH.

WHY IS IT NOT EXTENDED OVER VIRGINIA, AND INTRODUCED IN MARYLAND?

Planters of the best judgment in Carolina, look upon the culture of *Peas* as one of the most practicable and powerful auxiliaries in every system for the improvement of worn out lands. We have been indulging the hope of a communication on the subject from a gentleman of South Carolina, whose name is associated there, with whatever is proposed with a view to Agricultural improvement. From him we might expect a clear account, not only of the mode of culture and how it is brought to do its part in the general system, for immediate profit and ultimate improvement, but to be favored also with his opinion—always entitled to respect—as to its action. The theory, we believe, is that the pea draws its support, like clover, chiefly from the atmosphere, and that plaster of Paris has the same effect on both. We are well convinced from what we have heard that large districts of country, north of the region within which field-pea culture is practiced with great benefit, are losing much precious time and a valuable resource, in postponing their inquiries into, and adoption of that auxiliary to their plans for improving their farms. Until we get fuller and more exact information, we give the following from the last Southern Agriculturist:

There is perhaps no section of country in the upper districts, which has improved more in Agricultural condition than the "Old Pendleton" neighborhood—the result, we are told, of an Agricultural Society, composed of intelligent and practical farmers. We were struck with the manifest improvement in the breeds of cattle and hogs. The Berkshire cross has here told well—for the very simple reason, we presume, that stock is attended to. We have never seen a finer stock of hogs, in traveling through any country. More attention seems to be paid to the pea culture here, than in any section we have been. We are told that it is the opinion of many good farmers hereabouts, that land can be improved to a high degree by the pea culture. We have no doubt of the fact, if properly applied. There is a pea, the Chickasaw pea, which bears most abundantly, and once planted, is almost inextirpable. We have seen it put into corn ground—after the corn was taken off—pastured by the cattle and hogs all the winter—in the spring put in oats, and after the oats were taken off, the pea came up in great abundance. Now suppose these were to be let alone, and in lieu of the absurd system of pasturing stubble, the *vine* and *stubble* should be turned under in the fall—would not the land be vastly improved? We have no doubt—if the pea were sown on our stubble lands—a peck to the acre—and the crop turned in while in the bloom—that the effect produced would be equal to the best clover ley, so much esteemed in Virginia and at the north. It is an admitted fact, that leguminous plants exhaust a soil in a very slight degree.

The pea vine contains about 53 per cent. of potash, a most important ingredient in all soils, for the production of grain or cotton. If this should be returned to the soil, in addition to the carbon and nitrogen contained in the vine, it seems to me that there would be a manifest improvement. It has been discovered by analysis that cotton wool contains potassa 31.09 per cent.; lime, 17.05; magnesia, 3.26; phosphoric acid, 12.30; sulphuric acid, 1.22. That the seed contains phosphoric acid, 45.85; lime 29.79; potassa, 19.40; sulphuric acid. 1.16 per cent. While corn contains potassa 20.87; phosphoric acid. 18.80; lime, 9.72; magnesia, 5.76 per cent. The following analysis of straws may not be uninteresting:

	Wheat straw.	*Barley straw.*	*Oat straw.*
Potash.....	½	3½	15
Soda.....	¾	1	15
Lime.....	7	10½	2¾
Magnesia.....	1	1½	½
Alumina.....	2¾	3	½
Oxide of iron..	2¾	½	½
Silica or flint..	81	73½	80
Sulphuric acid.	1	2	1½
Phosphoric do.	5	3	½
Chlorine.....	1	1½	½
Total.....	100	100	100

From the foregoing data we learn that potash

is a most important ingredient in cotton and corn, and that the pea vine and cotton seed would be most invaluable manures—how easy would it be to avail ourselves of both. If a planter should sow twenty bushels per acre of cotton seed, upon a luxuriant vine crop, and put it in wheat—is it not reasonable to suppose that the advantage derived would be as great as from a clover ley, and gypsum. We are sure the elements are nearly the same, and we have no doubt of its effect. It is an admitted fact, we believe, that oats exhaust land more than any other grain crop. The mystery is solved, we think, by the analysis, for thereby oats are found to contain 15 per cent. of potassa, while barley straw contains only 3½, and wheat ½ per cent. No doubt the rapid growth of oats, and close pasturing, aids much in the exhaustion of the soil, and we derive an important lesson from the analysis—the want of potassa in the soil—which may be supplied by the pea crop, and the keeping off one's stock. Grass does not exhaust a soil, for the very simple reason that it takes up no potash. Grass contains carbon 45 per cent.; hydrogen 5; oxygen 38; nitrogen 1½; and ashes 9 per cent.

Every old woman in the country can tell us that post-oak and hickory contain the most potash—yet how few farmers know that this is the reason why post-oak and hickory lands are the most productive. Let a piece of land of this growth be exhausted and turned out, and it will put up pine, which contains less potash, perhaps, than any other tree. For this reason, an old pine field will produce but a few years without manure. In all old pine fields, you will find an abundant supply of silica, and if you will only add the potash, you are certain of a good crop.

We look forward to a day when the pea crop will be found a most perfect auxiliary in the resuscitation of the worn-out lands of the South. Clover cannot be grown here—the climate is altogether too hot to expect a luxuriant growth to answer for manure. We see no resource left us but the pea culture.

PAUL PRY.

SOCIETIES OR CLUBS FOR THE PROMOTION OF AGRICULTURE, HORTICULTURE AND FLORICULTURE.

IT would be altogether superfluous at this day, to dwell on the happy influences of such associations. On more than one occasion have we adverted to the subject, and shall take room only to say that, in the hope that such Clubs will be infinitely multiplied, we deem it expedient to make record of the following CONSTITUTION, which, with such modification as circumstances may suggest, will serve as a form for other Clubs that may come into existence; as come we hope they will, in every town and village throughout the Union. Especially are they wanting in the South. Let but two or three young men, desirous of being useful, get together and make a beginning, and they will soon see how easy it will be to create a taste for embellishment of gardens and grounds, and for Agricultural and Horticultural literature. Let them but plant the nut, and the tree may almost be left to grow and spread of itself. Take, for instance, our old State—Maryland. Why should not such a Club be established in good old Annapolis, in Easton, Cambridge, Princess Anne. Snow Hill, Elkton, Bell-Air, Frederick, Hagerstown, Upper Marlboro, in short, in every village of the State? It would take but a small portion of the means which are expended on less worthy objects, to form the nucleus of a Club Library. But we have said enough; "where there is a will there is a way."

We have no hesitation in saying that the discussions which take place, and the experience communicated, at the meetings of the *Farmers' Club* and the *Agricultural Association* in New-York, throw more light on the means of improving the Agriculture and Horticulture of the country; and that they are really the means of promoting more intellectual application to these subjects and of eliciting a greater amount of new and valuable suggestions and information, than are all the mere exhibitions that have taken place in the State. We have unaffectedly regarded it as a serious loss, that our engagements have not permitted us to give to these clubs and associations regular attendance, were it only for individual benefit, and the pleasure which every one must feel when he knows that he is making additions, even the smallest, to his stock of knowledge.

CONSTITUTION OF THE

NORTHAMPTON AGRICULTURAL, HORTICULTURAL AND FLORICULTURAL CLUB.

ARTICLE I. This Association shall be known as the NORTHAMPTON AGRICULTURAL, HORTICULTURAL AND FLORICULTURAL CLUB.

ART. II. The object of the Club shall be circulation of general intelligence and practical instruction, in all the branches of Agriculture, Horticulture and Floriculture:

1. By the establishment of a permanent library of the best books on those subjects.
2. By the establishment of a correspondence with other bodies seeking the same objects.
3. By procuring the most rare and valuable kinds of seeds, plants, shrubs and trees.
4. By the establishment of Lectures, Discussions, Exhibitions, and other means for the general circulation of knowledge on the subjects embraced by the Club.
5. By planting shade trees on all the avenues and public squares of the town.

ART. III. The officers of the Club shall consist of a President, three Vice-Presidents, a Corresponding Secretary, a Recording Secretary, a Treasurer, a Librarian, a Standing Committee of three persons each on Agriculture, Horticulture, and Floriculture, and a Board of Directors to be composed of the President,

Vice-Presidents, and Chairmen of the three Standing Committees, which Board shall have the charge and general management of the property and business of the Club, subject, however, to the order and direction thereof.

ART. IV. All the officers shall be chosen by ballot at the annual meeting of the Club, which shall be holden on the first Wednesday in August in each year, at such time and place as the Directors shall order.

ART. V. All special meetings of the Club shall be called by the Recording Secretary, on the requisition of a majority of the Directors, or of any five members, made in writing therefor, and notice thereof—as well as of all regular meetings—shall be published in one or more of the newspapers printed in Northampton, two days at least before such meeting.

ART. VI. Any person may become a life member of the Club by the payment of fifteen dollars into the Treasury at any one time.

ART. VII. This Constitution may be altered or amended by the votes of two-thirds of the members present at any regular meeting, provided the same shall have been proposed in writing at a previous regular meeting.

BY-LAWS.

1. Each member shall pay annually into the treasury the sum of one dollar. Any member who shall fail to pay his annual assessment, or any fines or forfeitures on books taken from the Library, for the space of ninety days after the annual meeting shall then cease to be a member of the Club, and forfeit all his rights and privileges as such, and to the library and other property belonging to the same.

2. All books, save such as the Board of Directors except, may be taken from the Library by the members on Saturday of each week. No book shall be detained from the Library longer than ten days, under a penalty of five cents for each day it is so detained, and any member lending a book belonging to the Club shall pay as a penalty the sum of one dollar for each week such book shall be so loaned.

3. Any member who may lose a book belonging to the Library shall pay the value of the volume or set, as assessed by the Librarian.

4. It shall be the duty of every member of the Club annually to plant at least one tree for fruit or shade.

5. The Treasurer shall give bonds to the acceptance of the Directors.

6. No money shall be paid by the Treasurer, unless upon a written order of a majority of the Directors.

7. A record of payment of subscription shall be the evidence of proprietorship for the year it is so paid.

8. The Treasurer at each annual meeting, and so often as he may be required, shall render an account of all receipts and disbursements of the Club for the year then past.

9. The Recording Secretary shall keep the records of the meetings, and at each annual meeting report a list of the members of the Club, and also of those who mey have forfeited their rights as members.

10. The Librarian shall keep a catalogue of all the books in the Library, and assess all fines for loss, damage, or detention of any book therein: also keep an account of all books loaned to members.

11. The Club shall hold monthly meetings for the purpose of hearing addresses, discussing questions, and receiving reports on the several subjects embraced by the Club.

12. No alteration shall be made in any By-Law, except at one of the regular meetings, written notice having been given at a previous regular meeting.

AGRICULTURAL PREMIUMS:

PROPER OBJECTS TO BE PROMOTED BY AWARDING THEM.

THE season, we suppose, may be said to be closed for *Agricultural Exhibitions and Addresses;* and it may be safely affirmed, that they have been generally attended with unabated interest and animation. There is abundant evidence that the right spirit is abroad—that the Agricultural community is fully sensible that theirs, too, is a business that is *in progress*, and susceptible of being meliorated and advanced, by that spirit of investigation and discovery which characterizes the age, and under the influence of which all other branches of science and of industry are marching onwards to higher and higher degrees of efficiency and success. The Addresses which have been delivered have been, in many cases, at once more scientific and more practical—more indicative of a conviction on the part of their authors and the public, that hereafter AGRICULTURE is to be looked to as an intellectual, and, in that sense, a polite and honorable vocation. Let that sentiment be followed up and encouraged; let the premiums offered, and all the measures taken by Agricultural Institutes and Associations, have a tendency more and more to prompt investigation of the principles and labor-saving improvements in the machinery and implements of Husbandry, so as to secure the most skillful combination of the materials for making manure, a better understanding of the time and manner of applying it; to secure more efficiency to labor by a better construction of the artificial contrivances for tilling the soil and harvesting its products. In a word, the desideratum is to obtain the greatest profit from the means at the command of the Farmer; and this should be the result, not of chance or empiricism, but of a system, the reasoning and principles of which should be well understood. Seeing that, as we before said, the spirit of improvement is abroad, the true object of all associated effort should be to enlighten it, and to give it a proper direction; and here, we respectfully think, great mistakes are sometimes committed: an undue and improper estimate is placed on objects which need no encouragement, and are, sometimes, even unworthy of it; while others, less attractive and showy, are disregarded and overlooked. It too often happens that success in the competition to which these premiums invite, cannot be the fruit either of genius or industry on the part of the winner of the premium, or conducive in any way to the

interests of the Agricultural community where such premiums are given. As for one example out of many: where is the benefit to be derived from offering a bounty to those who will send the largest sum of money, very often out of the County and State, for the most *splendid match geldings or mules to be had in the Union?* What sort of policy is it that offers a premium for the largest crop of corn or turnips, or the fattest hog or bullock, when the process adopted and the expenditure made to obtain the premium may make the crop or animal, as in his mother wit the Indian says, "cost more than it comes to;" and would prove a losing concern to all who should be lured into the adoption of the course pursued by the winner of the premium? The old Society of Massachusetts, which existed and had scattered the seeds of improvement broadcast, long before most of our Institutes and Societies came into being, could never be prevailed on to offer a premium for a *horse* of any kind, saying, that of all machines, the horse was the most expensive for practical Farmers. Without meaning to intimate that the same policy would suit all localities, it may yet be insisted that premiums should only be offered for the best elucidation of systems, and the production of the best specimens, that it would be to *the interest of Farmers in the County, or the State, as the case may be, generally* to follow and to cultivate. Particularly should it be the care of those who dispose of a Society's funds, to stimulate the mind to the discovery of new processes and new implements, and to the introduction of new and profitable objects of culture! They should rather discourage a mawkish taste for gew-gaws and fat things, and lead it to be entertained with what is new in its kind, ingenious and solid in its structure, labor-saving and useful in its principle, and economical and profitable in the means used to produce it, and in the uses to be made of it. Let that vulgar taste be discouraged which at an Agricultural exhibition we often see leads the whole mass of people away from the most interesting discourse on the principles of Agriculture, and from the rarest collection of the most ingenious and perfect machinery, to gaze at a *sleek, beefy, long-tailed, prancing stallion!* If the object be merely to gather an immense crowd, that may as well be done by a militia mustering, or an exhibition of Jacko riding on a pony.

In the last number we engaged to speak again in reference to the list of premiums then published, as offered by the *Highland Agricultural Society*, saying "the reader can then judge for himself, as to the exercise of the mind, the degree of intelligence, and the class of men required to battle for these prizes, and the usefulness, permanent usefulness, of the information which *such* prize essays must contain." We proceed to redeem that engagement, but imperfectly, in the fear that many may think we give too much space to the subject. But our aim is, let us once more explain, to invoke more *thought*, more calm investigation, on the part of executive officers and committees, who distribute the funds of zealous, well-meaning, and hopeful contributors, in a manner to produce the greatest amount of individual property and national wealth, rather than in a way to ensure dazzling spectacles and glittering arrays of things made and polished up for the occasion. We are persuaded that from this list of premiums and explanation of the reasons for proffering them, and the points to be considered and set forth by those who contend for them, American Societies may derive valuable information and take some hints that may be useful. We need hardly add that but for this strong persuasion we should not have yielded so much space to the subject. These extracts might be extended if we had room.

ESSAYS AND REPORTS ON SUBJECTS CONNECTED WITH THE SCIENCE AND PRACTICE OF AGRICULTURE.

FEEDING OF STOCK.—It is required to be ascertained, by direct experiment, the actual addition of weight to *growing* and to *fattening* stock respectively, by the use of different kinds of food, as well as the exact effect of weighed quantities of food of different kinds, upon the quantity and quality of milk, in full-grown milk cows *in calf and not in calf*, and the Society offers a premium of twenty sovereigns, or plate of that value, for the best Series of Experiments having this object in view, either in regard to growing, full-grown, and fattening Stock, or to Dairy Cows.

The attention of the experimenter will be drawn to the effects of turnips, carrot, beet, potato, or other roots, as well as to that of beans, oats, barley, and oil cake, and to the opinion that warmth is equal to a certain amount, or causes a certain saving of food.

Before commencing the comparative experiments, the animals must be fed on equal quantities of the same kinds of food for some weeks previously.

The animals tried against each other should be, as nearly as possible, of the same age, weight, condition, maturity, and purity of breed. Different breeds may be compared, and this will form an interesting experiment of itself.

The animals are to be treated, in every respect, alike. The food and drink to be regularly weighed and measured, and samples of the food (when this can be done) carefully analyzed. The live and, if killed, the dead weights of the animals, at the close of the experiment, should be ascertained, and the quantity of tallow which they yield.

RADICAL EXCRETION OF PLANTS.—Twenty sovereigns, or plate of that value, will be given for the best and approved Essay on the Radical Excretion of different Plants, or the various substances discharged from their roots. It is desirable to examine the subject physiologically as well as chemically, and to ascertain the existence, or otherwise, of a power of excreting various noxious substances previously absorbed, as well as of the supposed natural excretions. It will also be desirable to contrast, and endeavor to explain, the well-known fact of certain

species being crowded together for many centuries, as in native forests, and yet thriving, with the equally well-known fact of the degeneration of other species, as wheat, when cultivated for even a few years upon the same spot.

Note.—Decandolle, Macaire, and others, from various experiments, have been led to suppose that different excretions are discharged from the roots of plants, which may probably account for their effects in deteriorating the soil for the production of the same species. The Essays are expected to give the result of original experiments, determining the fact whether or not such excretions occur; and, if they do, to ascertain the chemical nature of the matter excreted from different plants, more especially the cultivated Gramineæ, Leguminose, and Cruciferæ.

Analysis of Oats.—Little is yet known of the true composition of oats, either of their organic or of their inorganic parts. The nature of the organic parts, for example, is believed to vary with the kind of soil in which the oat is grown—strong land, light land, and peaty soils, each growing its own peculiar samples from the same seed. The kind of manure and the season cause similar differences, which become more marked still, when different varieties of oats are compared with one another. Again, the inorganic part of the oat varies with the same circumstances of soil, manure, climate, and variety of seed; but it is not known to what extent it varies, either as to quantity or quality.

The Society offers a premium of fifty sovereigns for the analytical examination of the grain of oat, by which the greatest number of the above points may be ascertained.

The object of the inquiry is to throw light upon the general value of the oat, and of its different varieties, as a food for man or beast; and upon the mode of culture which in different districts ought to be adopted in order to raise this or that quality or variety.

On Raising Improved Varieties of Agricultural Plants.—For an approved Report, founded on actual experiment, detailing the means which may have been successfully employed by the reporter for obtaining new and superior varieties, or improved sub-varieties, of the different cultivated grains and grasses, clovers, beans, peas, turnips, potatoes, or other Agricultural plants, either by minute attention to the selection of the seed, by hybridation, or such other means as may have been found efficacious—the gold medal, or plate of the same value.

It is necessary that the varieties and sub-varieties reported upon shall have been proved capable of re-production from seed, and also that the relation they bear to others, or well-known sorts, shall be stated. The reporter is farther requested to mention the effects that he may have observed in different soils, manures, &c, to produce on the plants forming the subjects of report, and how far he may have ascertained such effects to be lasting.

Note.—Should any improved variety reported upon be the result of direct experiment by cross impregnation, involving considerable expense and long continued attention, a higher premium will be awarded.

On the Cultivaton of Red Clover.—For an approved Report on the best mode of managing lands which have become sick or tired (as it is termed) of common Red Clover, *Trifolium pratense*, so as to restore their capability of properly yielding that crop for hay, &c. without altering the generally practiced system of rotation—the gold medal, or ten sovereigns.

Influence of Plants on Dairy Produce.—For an approved Essay or Report on the Influence of Plants taken as Food, on the taste, flavor, or quality of milk, butter, cheese, or other Dairy Produce—ten sovereigns, or plate of that value.

Note.—It has been long known that the milk produced from particular pastures during certain months is deteriorated, and that the butter and cheese made from it are imperfect in flavor and in quality, so as sometimes to be unfit for use. This effect is supposed to arise from certain plants growing (and during these months flourishing) in the pastures; and it is to ascertain these, and their effects, that the above premium is offered. It is desired that the effects on the milk, &c. from the eating of such supposed noxious plants, shall be stated from experiment; and that dried specimens of the plants shall accompany the Essay. The particular seasons or months such plants are in their highest vigor should also be mentioned, and the best manner of extirpating them.

Reports on Irrigation.—The gold medal, or a piece of plate of the same value, will be given for the most approved account of the management of Water Meadows, founded on actual experiment within three years preceding the date of the Essay.

The experiments must be made on not less than five acres, whether detached or otherwise, and a description to be given of the rills or streams employed, and of the quality of the water, and of the manner of collecting and applying it, also an account of the land prior to the introduction of irrigation upon it, and of its estimated value at that period, and at the time when the Report is made; certified statements to be furnished of the quality of grass, if any, cut green in the spring, and the quantity and quality of the hay and aftermath produced upon the portion reported on, and the kind of stock, if any, which has been allowed to depasture it.

Construction of Tanks.—For a Report upon the most approved and most economical method of constructing Tanks for collecting liquid manure from stables, byres, and pigsties suitable to ordinary farm steadings; and also on the best means of draining off from the dung-hill the liquid manure into the Tank—ten sovereigns.

Competitors to state the most eligible materials for the purpose, the expense, and the form and proper dimensions in proportion to the number of cattle, &c. the best mode of drawing off the contents and of applying it to the soil.

Potato Blossoms.—As great diversity of opinion prevails regarding the advantage gained by picking the blossoms from the stems of potatoes, instead of allowing the germs to ripen into seed apples, the medium gold medal will be given for the most approved Report of trials made with different varieties of potatoes, quality as well as quantity to be taken into account.

The trials to be made on portions of not less than a quarter of an acre each, care being taken in removing the flowers that the stems are not injured.

Disease in Potatoes.—The Potato Crop, which is of such importance in this country, having become very generally infected with disease, the Society is desirous, if possible, of ascertaining whether or not, by the aid of chemical analysis, any light can be thrown upon the cause of the disease, and upon the remedy to be applied.

A premium of fifty sovereigns is therefore offered for the best and approved analysis of sound and unsound Potatoes, and of the soils on which they grew. The analysis of the several varieties of Potato, to embrace both their organic and inorganic constituents. The details of the experimental researches, which will include Potatoes both at taking up and at seed time, and the method of analysis adopted, to be given in the Essay.

On the Nutritive Properties of Turnips raised with different Manures.—With the view of testing the comparative feeding properties of Turnips grown with guano and with farm-yard manure, a premium of twenty sovereigns will be given for the most approved Report on the progressive improvement and increase in weight, (during a period of at least four months) of three lots of cattle, of not fewer than four in each lot, fed on turnips and straw, or turnips and hay, in the following manner:

1. Four fed on turnips grown with guano alone.
2. Four fed on turnips grown with farm-yard manure alone.
3. Four fed on turnips grown with one-half guano and one-half farm yard manure.

The animals selected to be as nearly as possible of the same age, weight, condition, and breed, and to be treated in a similar manner in every respect.

The live weights of the animals to be ascertained before they are put up to feed as well as at the close of the experiment, and if the animals are slaughtered, the dead weight and quantity of tallow which they yield respectively.

The turnips grown with the different manures to be on land of equal quality and in equal condition, and the quantity supplied to each lot to be weighed.

Tussac Grass.—The medium gold medal will be given for the most approved report, founded upon actual experience, on the cultivation in this country, of the Tussac Grass, *Dactylis cæspitosa*—seeds of this valuable grass having been lately introduced into Scotland from the Falkland Islands, where it is said to be found growing in great luxuriance, chiefly on peaty soils, within the influence of the sea. It is also said to grow on sandy soils under the same influence, and where the climate is similar to that of Great Britain.

This premium is offered in order that the result of experiments made may be publicly known, and to ascertain if its extended cultivation in this country would be beneficial.

Parties who have received portions of the parcels of seed transmitted by the Colonial Secretary are expected to report on the results of their experiments, including all the particulars regarding them, whether successful or not.

On the Advantages of Dibbling in Sowing.—For a Report, founded on actual experiment or observation, to ascertain and point out the advantages of sowing grain by the process of Dibbling—the gold medal, or ten sovereigns.

Wool.—For the best Essay on the Structure, Conformation, and Physical Properties of Wool, and on the Nature and Uses of the Sebaceous Secretion of the Skin of Sheep—the Yolk—the gold medal, or ten sovereigns.

Note.—Under the former head must be included a detailed description of the different kinds of Wool which are at present cultivated in the United Kingdom, with deductions from their structure as to their comparative value and utility for manufacturing purposes; and, under the latter, the special influences which the yolk exerts upon the Wool, the necessity or inutility of artificial salving, and in those circumstances where such has been used, the safest and most efficacious methods of removing it from the fleece, and the bleaching and purifying of the Wool from the "gilting" that may have resulted from its application.

Analyses of the Ashes of Plants.—For the best Series of Quantitative Analyses of the Ashes of the Cultivated Plants, or of the more common weeds growing on the different soils in Scotland—fifty sovereigns.

Note.—As the Society has already offered premiums for the analyses of oats and potatoes, competitors who make choice of cultivated plants will select any of the others in common cultivation, as wheat, barley, turnips, or beans.

The more abundant weeds should also be selected for analysis, full-grown, healthy plants being in every case taken.

Separate analyses should be made of the stalk of the plant and of the seeds, and in the turnip, or other plants with large roots, also of the bulb. Intending competitors are referred to the latest edition of Liebig's Agricultural Chemistry; and, for an account of the best method of ash analysis, to a paper by Drs. Will and Fresenius on the inorganic constituents of plants, in the Memoirs of the Chemical Society of London, part 9.

Experiments in Deep Plowing.—In order to obtain information on the results of subsoil plowing, trench-plowing, or any other mode of deep plowing on thorough-drained land, or on land that does not require draining, with the comparative merits of the different modes on the same soil, the Society offers an annual premium of the gold medal for the best and most satisfactory account of experiments made on not less than four acres of land of as nearly as possible the same quality and description—stating the description of soil, and the subsoil upon which it rests—in each of the methods of plowing, one-half of which shall have been deep plowed, and the other half cultivated in the ordinary way. The whole extent of ground to be under the same description of crop, and in other respects both portions to be cultivated and managed alike. The quantity and quality of the produce of each portion to be stated the depth reached by the plow to be noticed, with such other observations as the experimenters may deem deserving of attention.

Besides the principal premium for the year, the Society proposes to give honorary premiums for such reports as shall be deserving of distinction.

Vegetable Productions of India, China and America.—The gold medal will be given for the best, and the medium gold medal for the next best and approved Report on the Hardy or supposed Hardy Trees, and useful Herbaceous Plants, including grains and grasses, of China, the Himalaya country, the Falkland and South Sea Islands, California, and the high north-western districts of America, where such climate exists as to induce the belief that the plants may be beneficially introduced into the cultivation of Scotland.

There being reason to believe, that in addition to the useful vegetable productions which have of late years been introduced from Upper India, California, &c. many others may exist in the same regions, and in China, equally well suited to this climate, the Society has been induced to offer the above premiums with a view towards obtaining the fullest information relative both to the introduced sorts and those already known in this country, for the purpose of encouraging the introduction of the former, as well as the more extended culture of the latter. Reporters are, therefore, required to give the generic and specific names, with the authority for the same—together with the native names, in so far as known; also to state the elevation of the locality and nature of the soil in which they are cultivated, or which they naturally inhabit, with their qualities or uses; and it is farther requested, that the descriptions be accompanied, in so far as possible, with specimens of the plants and their fruit, seed, timber, or other products.

The transmission of living plants in boxes, or in cases covered with glass, may be attempted where practicable: the external air being excluded, and almost no water given during the voyage. Where this plan is adopted, smaller seeds, berries, or heps, may be thickly mixed with the soil or earth in which the plants are placed. Seeds may be sent home in cones, wrapped in brown paper, packed in a box, to be kept in a cool airy part of the cabin, but on no account in the hold, nor in close tin cases. In the event of the seeds of Coniferæ being separated from the cones, with the view of lessening the bulk and weight of packages intended for overland carriage, hasty and severe heating, in extracting the seeds, should be carefully avoided.

REPORTS ON IMPROVED RURAL ECONOMY ABROAD.—The honorary gold or silver medal of the Society, according to the value of the communication, will be given for approved accounts, founded on personal observation, of any useful practice or practices in Rural or Domestic Economy, adopted in other countries, which may seem fitted for being introduced with advantage into Great Britain.

The purpose chiefly contemplated by the offer of this premium is to induce gentlemen who may visit other countries to take notice of and record such particular practices as may seem calculated to benefit their own country in the branches of the arts referred to. The earliest opportunity will be taken of communicating the reports to the public.

WEBSTER'S DOMESTIC ECONOMY AND HOUSE-KEEPING. Edited in this country by DOCTOR REESE, and published by the Harpers—

Is a work of more than 1000 pages, illustrated by nearly one thousand engravings. Perhaps it would be easier to say what it does not than what it does contain: for it seems to be a sort of *omnibus* in which all sorts of things relating to House-Keeping and Domestic Economy have been gathered up. Take, for one example, MILK—cows'—its properties—artificial coagulation of—skimmed—considered as an aliment—asses'—goats'—ewes'—mares'—camels'—buffaloes'—supply of to the metropolis—adulteration of—preservation of—management of in the dairy, &c. &c. With this book, *and a good housewife*, any man may get along, provided he plays his own part, as any man ought to do, or—be *Caudled*.

REPORT ON THE SCHEME FOR REDUCING THE GROWTH OF COTTON IN THE U. S.

WE regret not to have in this number space enough for the "Report by W. W. Seabrook & T. Belton O'Neale, on the scheme for reducing the quantity of cotton grown:" and which we now find for the first time in the Southern Planter for November. As might have been expected, they came promptly to the conclusion that the scheme was impracticable, and not expedient if it could be put in practice. Not at all incompatible with that conclusion, is the yet remarkable passage in the Report that "another cause of distress is, that in a large portion of the Southern country, cotton is cultivated, when its production does not now, and never can at all compensate the planter for the labor bestowed. *Then* it is desirable for every one, that other branches of industry should be pursued. In such sections, says the Report, manufactures may be most profitably substituted; and every manufactory established, will be not only additional wealth to the proprietors and the country, but will also materially aid the cotton planter by increasing the consumption." This very interesting Report goes on to add "to what else [than cotton] can the planter of the South, so profitably turn his attention? To grain? He already, in ordinary years, produces twice as much as the middle States, and about one-eighth more than the West. In Indian corn alone, the produce of the South, by her last census, was three hundred millions of bushels! If the planter of cotton is engaged in an unpromising business, much more so is the raising of grain. The interest on capital invested in Agriculture at the north is less than 3 per cent.; *here* it is about 4 per cent. That the rice and tobacco culture might be profitably extended in this State, and will be in the South-West and Texas, is true. Millions of acres in South Carolina, including the lower counties, are admirably adapted to the raising of rich grasses. This might be added as another branch of industry, from which reasonable profits could be realized, and might very well be added to the cotton planter's income. The business of tanning, and the manufacture of leather, might be, and ought to be extended. In this State, all the means of a successful pursuit of this branch of industry are at hand, and within the reach of every one. Hides, lime, bark, and mechanics (slaves) are abundant. A few years ago the capital engaged in this branch of industry in Massachusetts was $14,000,000, while that of cotton was $13,000,000, and wool less than $11,000,000."

The committee farther report their opinion that with many of the planters in Mississippi, Louisiana and Texas, the culture of tobacco and sugar will supersede that of cotton.

Deeming this Report, from such a committee on a great Agricultural question, as one of primary importance in a national view, we shall preserve and extend it through the Agricultural department of the New-York Albion, until it can be transferred, for the same purpose, to the pages of the Farmers' Library.

SHEEP HUSBANDRY ... EFFECTS OF CLIMATE AND FOOD.

THOSE who have complimented this Journal with a careful perusal, need hardly now be told that we consider *Sheep Husbandry*, under existing circumstances, as among the most important subjects that can engage the attention of the inquiring agriculturist; and they will of course have concluded that in due time, we design to present it in all the aspects in which it has been discussed by the most experienced men and the most enlightened writers. To do this, will require research, consideration and space, proportioned to its magnitude as a branch of national industry. We have already at command, the information to be derived from English and American books, and from translations of French authors who have gone yet more thoroughly into the natural history and constitution of wool and wool-bearing animals; but we have reason to believe that in this case as in a great many others, much scientific and practical knowledge, is wrapped up and concealed from English readers, in the *German language*. We know that profound works in that tongue have been written, on wool, and on the various races of sheep, and have accordingly taken measures to procure those works and to have them thoroughly sifted, even for any grains of information they may contain.

In the mean time, to answer, for the nonce, inquiries on some particular points, prompted more particularly by the disposition which we know exists, to push this branch of business in the south, we offer the following extracts and translations:

ON THE POINT OF INFLUENCE OF CLIMATE.—We take the following from the volume on *Sheep*, in the series of volumes put forth by that most *efficient and patriotic association*, the Society in England, for the DIFFUSION OF USEFUL KNOWLEDGE.

"The excellency of the Merinos consists in the unexampled fineness and felting property of their wool, and the luxuriance of the yolk, which enables them to support extremes of cold and wet, quite as well as any other breed; the easiness with which they adapt themselves to *every change of climate*, and thrive and retain, with common care, *all their fineness of wool under a burning tropical sun*, and in the frozen regions of the north; an appetite which renders them apparently satisfied with the coarsest food; a quietness and patience, into whatever pasture they are turned, and a gentleness and tractableness not excelled in any other breed."

Those who have had the good fortune to see Mr. JEWETT'S prize ram *Fortune*, and his progeny, need go no farther to see an exemplification of the best qualities of the Merino, as they have been fully maintained "in the frozen regions of the north." The more doubtful matter is about the "burning sun," of Texas, for instance. Above is an authority which has always commanded the public confidence.

"In general," says THAER, in that part of his work which we have not yet reached in the course of re-publication, "we may lay down as a rule for our country, [Germany,] that horned cattle are most profitable on low pasture, and when maintained by stall feeding. Sheep, on the contrary, on all *dry and elevated pasture grounds, natural or artificial.*

"The Merino breed is distinguished from others by slower development, shedding its teeth later, not so soon coming to maturity, and being longer in attaining its full growth; its progress may, however, be accelerated by more nourishing food. On the other hand, sheep of this race live to a greater age, and become stronger than others. Merino ewes have been known to retain their teeth to their fifteenth year, and to produce healthy lambs at that age.

"Sheep generally bear, or go with lambs, for twenty-one weeks and a few days. Ewes generally get into heat for the first time after lambing, in six months; and the most authentic writers maintain that the healthiest lambs are the produce of the connection which takes place on the first indication of rutting. Others maintain it to be better to defer till the second time of coming into heat, that is to say, three weeks later, in order to give the ewe time to recover her strength after suckling.

"Merinos," says the same author, "are decidedly more subject to rot than ordinary German sheep. It is therefore indispensable in the maintenance of a flock of high bred sheep, to have all the damp places on their pastures drained by digging trenches, and drainage-furrows.

"Good mutton should not be spongy or very porous; but soft, of delicate fibre, and succulent.

"It has been found that wool when thoroughly washed after shearing, loses in weight about 54 per cent. provided it has not been previously washed on the back. In the latter process, the wool probably loses about 25 per cent. of its weight in the unwashed state.

"A moderate quantity of fat mixed with the fibre, is much esteemed, but the excess of that substance, which shows itself on the outside, sometimes in layers, five or six inches thick, is fit only for the poorer class of people, who use this fat to eat with the leguminous vegetables on which they live."

INFLUENCE OF NUTRITION ON WOOL.

[Translated from the Journal D'Agriculture Pratique et de Jardinage, for the Farmers' Library.]

THE feeding of sheep has a most marked influence on the quantity and quality of the wool. The circumstances to be observed on this subject are the following:

1. To obtain wool of a good quality, and in adequate quantity, sheep must be well fed.—

The art of nutrition being directed, in the *ovine* animal, toward the superficies, and being confined to the growth of wool, the augmentation of wool in length and in flexibility experiences a moment of rest at the time that nutrition is stopped, when the animal is deprived of his necessary quantity of feed. Sheep, well fed, compensate for the increase of expense by the weight of their fleece and the increased quality of the wool.

However, there is an essential difference to be observed between short-wooled and long-wooled sheep. Abundant and extremely nutritious feed soon makes the wool of the first too long—an inconvenience which is not to be feared from the second class of sheep. Flat countries, interspersed with fat and fertile pasturages, are thus naturally destined to the production of long wool.

2. When sheep receive too little nourishment, or that this, given in insufficient quantity, is not sufficiently nutritious, the wool preserves its fineness—acquires a certain length—but it is wanting a certain degree of resistance, (or elasticity;) it is also unfurnished with the requisite oiliness, and thus makes it brittle, rough to the touch, and dry as flax.

3. The regularity in the dispensation of food is of the highest importance; the wool is, in a great measure, influenced by it; and this can be observed when, in winter, sheep are well fed with hay, grains, beans, oil cake, and when that supplementary food is too soon suppressed in spring. The wool experiences a period of rest later, continuing to grow under more favorable circumstances; the woolly hair is less elastic; and, in proportion of its extent, a weak point is discovered—a true cicatrice—indicating the irregularity of growth which we have signalized.

4. Opinions differ with regard to the action of certain kinds of food on wool; all, however, agree to attribute to fertile pastures a marked effect. The fleece is more abundant—the hair is longer, and is distinguished by its smoothness, its flexibility, and its strength. Grains produce an analogous action. These aliments augment the oiliness and the good qualities of the wool.

Sturm establishes as a point that all nutrition that favors transpiration produces a finer wool; they are those that contain much nutritive matter in a small volume. Pastures interspersed with aromatic plants enter into this category—as well as grains given in the sheep-fold.

Two sheep (says Perrault de Jotemps) belonging to the same race, covered with the same quality of wool, but managed in different ways, so that to one is given feed to fatten, and to the other his ordinary diet, present already to the first shearing a variety of wool. With the first it will be longer, coarser, and will have lost its elasticity; these consequences (he adds) are much more sensible at the second and third shearing. The other sheep will have preserved all the primitive qualities of the fleece. The difference of diet being continued to the third generation, the descendants cannot be recognized as being derived from the same source.

From Mr. Morrell's excellent work, the latest American one, on Sheep, published lately by the Messrs. Harpers, we take the following:

The author remarks: "The variations in the diameter of the wool in the different parts of the fibre will also curiously correspond with the degree of heat at the time the respective portions were produced. The fibre of the wool, and record of the meteorologist, will singularly agree, if the variations in temperature are sufficiently distant from each other for any appreciable part of the fibre to grow."

In confirmation of the general fact as to the influence of climate on wool and hair, the remarks of Mr. Hunter, an English author of high authority, are quoted: "Sheep carried from a cold to a warm climate soon undergo a remarkable change in the appearance of their fleece. From being very firm and thick, it becomes thin and coarse; until at length it degenerates into hair. Even if this change should not take place to its full extent in the individual, it will infallibly do so in the course of a greater or less number of generations. The effect of heat is nearly the same on the hairs of other animals. The same species that in Russia, Siberia, and North America, produce the most beautiful and valuable furs, have nothing in the warmer climates but a coarse and thin covering of hair."

The above must be received with some limitation. Mr. Youatt makes the following remarks: "Temperature and pasture have an influence on the fineness of the fibre, and one which the farmer should never disregard; but he may, in a great measure, counteract this influence by careful management and selection in breeding. The original tendency to the production of a fleece of mixed materials existing, and the longer coarse hair covering and defending the shorter and softer wool, Nature may be gradually adapting the animal to his new locality; the hair may increase and the wool may diminish, if man is idle all the while: but a little attention to breeding and management will limit the extent of the evil, or prevent it altogether. A better illustration of this cannot be found, than in the fact that the Merino has been transplanted to every latitude on the temperate zone, and to some beyond it—to Sweden in the north, and Australia in the south, and has retained its tendency to produce wool exclusively, and wool of nearly equal fineness and value."

M. Lasteyrie, the unwearied advocate of the Merinos, uses this remarkable language: "The preservation of the Merino race in its purity at the Cape of Good Hope, and under the rigorous climate of Sweden, furnish an additional support of this, my unalterable opinion, *fine-wooled sheep may be kept wherever industrious men and intelligent breeders exist.*"

Notwithstanding the above is so consolatory, and withal so very encouraging to our brethren of the Southern States to embark in sheep husbandry, yet it is undeniable that in northern latitudes the finest wools are produced; but this has arisen much from superior skill in breeding,

and great assiduity in management in every regard. If sheep are properly selected from high-bred Merino and Saxon flocks, and taken to a latitude not south of 25°, if rightly managed, will suffer little deterioration for many years, and will produce wools of a like description of the Australian, soft, of even and long filament, fit for felting, and also admirably adapted for the finest and most beautiful of worsted fabrics. An instance is known by the writer, (Mr. Mark H. Cockrill,) of an imported flock of Saxons having been taken to Tennessee some 20 years since, and judging from the samples of wool from it now in his possession, the conclusion is inevitable, that little or no deterioration has been produced by the climate. If sheep are provided with suitable retreats for shade during the heat of the summer months, there are many districts in the Southern States unsurpassed for wool cultivation. If there is a tendency to coarseness, it will be retarded or wholly prevented by an occasional recurrence to northern stock getters.

Many imagine that the climate of the Southern States is wholly unsuitable for the production of a fine fleece, because of the inferiority of the wools of South America. The degeneracy of the Merinos taken there, has not arisen so much from the climate, as because "industrious men and intelligent breeders" were not present to manage them; furthermore, very many of the sheep transported there from Spain, were of the Chunah breed, producing very coarse wool, and these were promiscuously bred with the Merinos. The conservative power over the fleece lies in good management far more than climate.

PETERS' AGRICULTURAL ACCOUNT BOOK.

DARIEN, N. Y. Nov. 10, 1845.

To J. S. SKINNER, Esq:

Dear Sir—It gives me great pleasure to see you urge upon the farmers the importance of keeping a Farm Register. There is no excuse for the gross and culpable negligence of those who omit it. For if a register or account book is needed by any class of men, more than another, that class is the farmers.

Farming properly conducted is to a certain extent a series of experiments, the results whereof should be carefully registered, and not left to the uncertainty of human memory.—What intelligent farmer is there who would not now give his best horse for a careful register of his daily doings since he first commenced farming for himself. What a mass of facts would now be spread out for his instruction and daily guidance. And how few farmers' families there are in this broad land wherein the keeping of such a daily account of farm transactions would not form a most useful and instructive source of amusement. What would tend more to fix in the minds of the young people a habit of close observation, and patient investigation?

Having felt the want of some kind of a work which would do away with much of the complexity of the present system of commercial book-keeping, I compiled a book (a copy of which I herewith send you) which would put it in the power of every farmer with little trouble to keep a complete account of all his doings.

I feel quite sure that you can fully appreciate the importance of such a work. I do not claim for it perfection, but I do think it is the best that has yet been published.

You cannot think how much I prize the "*Library and Journal.*" The plan is right, and the public appetite requires just such a work, but I saw its appearance with fear and trembling, for I thought it would be long before it would even pay cost to its enterprising publishers. With best wishes, my dear Sir,

I remain very sincerely yours,
T. C. PETERS.

With the above we received the book referred to. We shall place it in the hands of the Printer to be so arranged that the reader may fully comprehend the system. It will be seen, as the author says in his introduction, that while "blanks are left in the heads of many columns, so that the farmer may put in any item he thinks proper, and he can also vary the printed captions to suit circumstances—the printed heading is put in to show the manner in which they should be filled." It would appear to have been framed for Northern Husbandry, but the system, he adds, "is universal in its application, so far as Agriculture is concerned, and may be made to answer as well upon the plantations at the South, as the farms of the North."

This "Complete system of Book-keeping simplified and adapted to the use of Farmers," is very appropriately dedicated to JAMES S. WADSWORTH, Jr., then President of the Agricultural Society of the State of New-York,—the author being at the time President of the Genesee County Society—not only as a slight token of his personal regard, but of approbation, of the course he had taken in the great though still too much neglected cause of agricultural improvement. Allusion is fitly made to the debt of gratitude due to Wadsworth, the elder, for services of which we hope the Farmers' Library for January will be made the medium of a more particular record.

The work sent us by the author is a half bound two quire broad foolscap. The Daily Journal of transactions occupies or comprises about one-third of the book. The Labor Account about 8 pages; Current Account of Grain and Root Crops, 4: Account of Hay and Fodder Crops, 4; Monthly Account of Live Stock, 8; Manure Account, 4; Weekly Dairy Account, or Fattening Animal Account, 8: Cash Account, Monthly, 8; Account of Sales, Weekly or Monthly, 4; Expense Account, Weekly or Monthly, 4; Farm Implement Account, 4: Land Account, 4; Profit and Loss Account, occupying about one-third, or the remaining portion of the book. We give a specimen of the manner of ruling, but we presume the Book itself can be purchased at most of the Agricultural Dépôts.

No. 1.] DAILY JOURNAL OF TRANSACTIONS.

Date.	Items.	Remarks.

No. 2.] WEEKLY LABOR ACCOUNT.

Date.	Workmen's Names.	Kind of Work.	M.	T.	W.	T.	F.	S.	S.	No. Days.	Rate pr Day.	Total.	Remarks.

No. 3.] CURRENT ACCOUNT OF GRAIN AND ROOT CROPS.

Date.	Description.	Sown or Planted.	*Bushels.* Thresh'd, Husked, or Dug.	Consumed.	Sold.	To whom, or by whom.	Rate per Bushl.	Total.	Remarks.

No. 4.] ACCOUNT OF HAY AND FODDER CROPS.

Date.	Kind.	*Loads in* Stack.	Mow.	*Consumed by* Horses.	Sheep.	Cattle.	Sold.	To whom.	Amount.	Remarks.

No 5.] MONTHLY ACCOUNT OF LIVE STOCK.

Date.	Description of	No.	Increased by Birth.	Purchase.	Decreased by Sale.	Accident.	Consumed.	No.	On Hand.	Remarks.

No. 6.] MANURE ACCOUNT.

Date.	Description.	Quality.	Quantity.	Crop.	No. Acres.	Total Am't.	Value.	Remarks.

No. 7.] WEEKLY DAIRY ACCOUNT, OR FATTENING ANIMAL ACCOUNT.

Date.		Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.	Total.	Remarks.

No. 8.] CASH ACCOUNT.—MONTHLY.

Date.	Of Whom Received.	Amount.	Date.	To Whom Paid.	Amount.

No. 9.] ACCOUNT OF SALES.—WEEKLY OR MONTHLY.

Date.	Hay.	Wheat.	Oats.	Potatoes.	Butter.							

No. 10.] EXPENSE ACCOUNT.—WEEKLY OR MONTHLY.

Date.	Blacksmith.	Wagon-maker.	Harness.	Clothing.	Hired Men.	Hired Women.	Groceries.

No. 11.] FARM IMPLEMENT ACCOUNT.

Date.	Plows.	Harness.	Rakes.	Hoes.	Wagons.	Sleighs.				

No. 12.] LAND ACCOUNT.

Acres in										
W.Wheat.	Corn.	Oats.	Peas.	Meadow.	Pasture.	Beans.	Potatoes.			

No. 13.] PROFIT AND LOSS ACCOUNT.

Date.	*Profit.* All Receipts and Gains.	Amount.	Date.	*Loss.* All Losses and Expenses.	Amount.

EXPOSITION OF THE CONDITION AND RESOURCES OF DELAWARE.

At the late Farmers' Convention, one of the plainest, least glittering, but most useful discourses, was by Mr. John Jones, a practical farmer, in attendance, from near Middletown, Delaware. He came down at once to practical matters, and gave a most encouraging and agreeable sketch of the progress and prosperous condition of Agriculture in his own State, and of the growth and activity of business at Wilmington. He dwelt on the advantages to be anticipated from the extension of manufactories on the Brandywine. The capital employed in manufactories in Newcastle County alone, was reported in 1840 at $1,384,700. The annual value of $314,-500, about one-sixth of what was manufactured in Pennsylvania. The manufacture of powder was 2,100,000 pounds. The Messrs. Dupont manufacture weekly, 5,000 pounds of *wool*. They brought the first full bred Merino ram *Don Pedro*, into that County; but it did not need Mr. Jones's evidence to establish the association in our minds of the name of Dupont with what is most enterprising and useful and patriotic in the progress of American Industry.

Mr. Jones stated that Major P. Reybold is now the most extensive wool grower in Delaware, having for some years past, flocks of about two thousand. He gave, in short, a graphic account of the husbandry of Delaware in all its branches; giving credit to those who have signalized themselves, by skillful attention to different objects. He remarked that the farmers of Delaware generally deemed it better not to raise hogs; preferring to sell their corn at 40 or 50 cents to their eastern, and buy their bacon from their western brethren. He noted with exultation, that *no whisky* is distilled in Delaware. "No," said he, emphatically, "*not one drop.*" In reply to the reputed unhealthiness of Delaware, and the Eastern Shore of Maryland, he proved the contrary by statements of obstinate facts drawn from the Census. On the score of taxes, he knew not the exact per cent., but he paid on 740 acres of land, only $56,63. His statement of the provisions for Education, was highly honorable to the State.

Mr. Jones gave some instances of remarkable success, naming individuals and particulars—as for example: J. Sampson of Delaware, raised 103 bushels of wheat on 2¾ acres; E. Bellah of Brandywine, 39 bushels to the acre on a field of *nine* acres, *sowed among the standing corn in July!* Dr. Noble reported the case of his tenant R. Millwood, who, on a field of thirty acres, made 37½ bushels to the acre—as adjudged by measurement of two acres of average yield. This land was a few years ago purchased for $15 an acre, and would not then have yielded more than five bushels—the land was improved by application of 200 bushels of shell marl and 10 horse-cart loads to the acre, of Philadelphia compost consisting of the refuse of skin-dressers, glue boilers, &c. He attested great and very general improvement through the State, especially in their wheat crops, which he ascribed chiefly to the use of lime and better modes of culture, and to improved implements—to the use of the drill, roller, &c. He spoke in high terms of the efficacy and popularity of a drill machine invented by Moses Pennock, a plain, unpretending farmer, of inventive genius and useful in his example—the same who invented that valuable implement, the revolving horse-rake. Prompted by conviction of its value, many of these drill machines have been put in use in Delaware with the utmost satisfaction and success. Hussey's reaping machine was highly commended on experience of its efficacy—over twenty acres a day had been cut with it in a complete manner, and he thought ten or twelve would be purchased in his county next year. Mr. Jones was well impressed with the influence of Agricultural Associations, Farmers' Clubs for social meetings and discussions, and dwelt with emphasis on the benefit and greater security of a home market for Agricultural produce.

He gave an impressive account of the "*peach business*" in Delaware, of which, as well as of the sheep business, Major Reybold is considered the "Field Marshal." He and one of his sons shipped 500 baskets of peaches in one day. Previous to the first of September he had shipped upwards of 1600 baskets. Mr. Jones's exposition was without flourish and to the point—calculated to make a strong impression as to the capacities of little Delaware and the industry and energy of her sons. Many might make more dazzling addresses, and talk more about Adam and Eve and the Garden of Eden, and the Emperor of China taking the handles of the plow, and about Columella and Virgil,

but "all is not gold that glitters"—and for setting forth her skill and industry and making known her resources and her progress no State need have a better representative than was this —himself—one of her most successful working farmers. How much more encouraging, effective and useful is the downright experience of such men, than a mere parade of monstrosities, and queer things—as "calico corn," and fantail pigeons.

The miserable census, put down the whole wheat crop of Delaware in 1839 at 315,165 bushels, and four years after that the Commissioner of Patents places it at only 333,103, while Mr, Jones instances a single farm of 375 acres that produced 2,884, nearly the one-hundredth part of all that is credited to the State.—He has no doubt that the crop of Newcastle county alone was upwards of 400,000 bushels. What miserable deceptions are the returns and estimates we have had of the industry and products of the country.

No State in the Union is going ahead faster in agricultural improvent than Delaware. She has the advantage of being in the centre of light and knowledge. Tho' his place has been well supplied, we were sorry to see that Doctor Thompson had retired from the Presidency of the Society, which has contributed so much to the honorable position which Delaware holds among her sisters.

If it were not altogether impossible to publish the agricultural addresses delivered at the various exhibitions, we should have been tempted to give place to Doctor Muse's and the venerable Jonathan Roberts's, as also to Mr. Sellman's, at Marlboro. With such advocates the cause of Agriculture can never go backwards—that is, if agriculturists will discard demagogues and commit the business of legislation to those who being thoroughly identified with, can the better understand their interests.

Let them put on their considering cap and solve a few questions. How much of the money raised by and for the government, is directly or indirectly paid by the landed interest, and how much of it is expended for its account?

HEMP AND FLAX.

New mode of preparation for the Manufacturer—Important Invention.

The value of Hemp and Flax, and the great range of country adapted to their culture, have not escaped our attention. We are fully sensible of our obligation to procure and promulgate the best information to be had, on the culture and preparation of these articles, and hope to be able to fulfil any reasonable anticipation on that point. But, with all the space at our command, we have not yet been able to take up this branch of industry in a manner at all comporting with its importance. The most recent item of note in regard to it, that has fallen under our notice, consists in the improvements effected in the preparation and manufacture of them by Mr. Billings. Of what is peculiar in both, fuller accounts will be given in the January number of the Farmers' Library. In the mean time we took an opportunity of getting an experienced manufacturer to look at the operation of his machine, a small one on rather a model scale, and from him we have since been favored with the following:

Paterson, N. J. Nov. 19, 1845.

To the Ed. of Farm. Lib:

The object of Mr. Billings is, to take the Flax from the farmer before rotting, and to rot, dry, break and scutch it, for the manufacturer.

The break seems to me to do its work very rapidly, and better than I have seen it done heretofore; the ends of the Flax appear to be rather more entangled, but the scutcher relieves it from this difficulty, and there is this advantage in this latter machine over many others: that it leaves the Flax in better condition for the hackle, and can be prepared on any scale graduated to suit the purpose to which it is applied.

I had no means of ascertaining what the waste would be in the processes of these machines, but Mr. Billings says he can so prepare the Flax as to yield over the rougher and fine eight huckles, 85 per cent. of long Flax. This exceeds, by 20 per cent. the produce of any other known machines. The best Flax produced in this way will not yield over 65 lbs. of Flax to the 100 lbs. of scutched Flax, and if this be so, it will be of just that value over any other machine to the growers of Flax.

A similar plan, as I suppose, for retting the Flax, was tried at Hunterdon, New-Jersey, about ten years ago, and was found unsuccessful. In Europe, attempts to use steam for like purposes have failed, and the Flax was never so strong nor so durable, as when rotted in the pots, as they are called, by the operations of Nature.

My own impression is, that one cause of failure has been the season in which it has been done. If it were delayed till September or October, I think it would do better and be more likely to succeed.

Very respectfully, I. T.

Mr. Billings has seen the above, and says our correspondent has been led to erroneous conclusions by a misconception of his processes. He says the rotting process is conducted on scientific principles, and has been found to be perfectly successful. Some eight or ten pages of our next number will be given up to this interesting subject.

THE PREMIUM FARMS IN PRINCE GEORGE'S COUNTY, MARYLAND.

THE FIRST HONORS OF AGRICULTURE—Are those which are awarded for *best managed farms*, and hopeless, almost, is the case of him, among young farmers, who is not animated by the ambition to win them. It should be coveted in rural, as the marshal's baton is in military life, with this exception—that while the latter, like the key of Blue-Beard's closet, is marked with indelible stains of blood, the chaplet that wreathes the brow of the victorious farmer, is the growth of useful industry, the blessed emblem of peaceful abundance—yet it has been the miserable, the barbarous policy of governments, even of *republican governments*, to reserve all their honors and rewards, their high pay and their life salaries, to provide hospitals and medicines, only for those whose province it is, when nations can be drawn into war, to accomplish in the shortest time the *greatest possible destruction of human life. Will nations ever learn to think for themselves and cease to be ridden by demagogues for their own sinister purposes?*

For ourselves, in our limited sphere, we shall do what we can to give public sentiment a right direction on these points—to teach the American Republican Farmer to compel legislators to bestow public honors on the *plow*, rather than the sword—on civil virtues in preference to military achievement. We have now room only to register the award of the Prince George's County Agricultural Committees last month.

For the best managed Farm, to "*Mount Calvert* Plantation," containing 900 acres owned by Capt. JOHN BROOKS.

The second premium to "*Eglinton* Plantation," containing 300 acres, own by W. W. W. BOWIE, Esq.

The third to "*Willow Brook* Plantation," combining about 900 acres owned by THOMAS DUCKETT, Esq. A conspicuous place shall hereafter be assigned *to all such awards*, as they may come to our knowledge.

For his truly excellent address, a vote of thanks was unanimously voted to Hon. JOHN SELLMAN, at the instance of R. W. BOWIE, a large Planter, who loves the honor of his State as he does his own, and for *its sake* would *self-impose and pay, any amount of taxation*. Alas! for the reproach, that the mention of the fact implies against our native State! Ay, we were going to say—our native—but the pen refuses the office. These things have close connection with the character of an Agricultural people, and are, therefore, fit subjects for allusion in a journal profoundly devoted to the honor and prosperity of that class of the community.

EXPENSE OF HORSE POWER.—We have long been persuaded that agriculturists, wilfully or unreflectingly, shut their eyes against the serious expensiveness of horse power, as compared with other animal or machine power. It would be well worth their while to compare the cost of keeping a horse with that of keeping the ox, the mule, and the man. In examining the following statement, let the reader bear in mind that by "*corn*" the writer means oats, probably, and he will be near enough for the purposes of comparison, by estimating a penny (d.) at two cents, and a shilling (s.) at a quarter of a dollar.

One-horse Carts versus Wagon.—I have no light plowing land, nor have I more than 20 or 30 acres of very heavy land. I will, therefore, relate my actual experience. In the employment of wagons and the old broad-wheeled dung-carts, I required one wagon, one cart, and three horses to every 50 acres of arable land. I also kept a light cart for general purposes. Now that I am employing carts, I find that I get through my work much more easily with two horses and two carts to 50 acres. The following is a fair calculation of the first outlay under the two systems:

	£	s.	d.		£	s.	d.
1 wagon.....	25	0	0	2 4-inch wheel 1 horse carts	24	0	0
1 dung-cart...	15	0	0	Two horses...	40	0	0
3 horses.....	60	0	0				
Extra harness	2	0	0		64	0	0
Proportionate cost of the light cart to 50 acres....	3	0	0	Balance in favor of carts	41	0	0
Total.....	105	0	0	Total.....	105	0	0

This shows a saving of upwards of 16s. an acre, which many young farmers would find extremely useful to expend in stock or implements. There is also some annual saving in the expense of the repairs under the cart system, as well as that of the keep of one horse to every 50 acres. I believe there are those who think this of little importance; that they can keep horses at a very small expense, say from 3s. to 5s. per week; and that if fewer are kept, they must be fed more highly, and therefore the cost is much the same, forgetting that the more horses kept, the greater number of hands required to attend them, whose time also is wasted if the animals are not in a state to do a good day's work; nor is the manure nearly so valuable as when the horses are kept in a better state. To estimate the saving of keeping one horse less to 50 acres, I will make my calculations from my own method of keep. I have not for years allowed my horses any hay. In winter I give them 10 lbs. of corn, 10 lbs. of carrots or Swedes, and as much straw-chaff as they will eat per diem. The corn I value at 6s. per week, the roots at 9d., and the straw, with the expense of cutting into chaff, 1s. 3d., making in the whole, 8s. per week; which, with 1s. for shoeing, &c., amounts to 9s. In the summer I give them green clover or vetches, without corn, which I value at 5s. per week, making 6s., with 1s. added for shoeing, &c.; the average, therefore, for the whole year, will be 7s. 6d. each horse. It therefore follows that if we can save one horse in the cultivation of 50 acres, it will amount to nearly 8s. per acre.

[E. Bowly, Royal Eng. Ag. Soc. Jour.

AGRICULTURAL SURVEYS.—The Legislature of Maryland would do well to provide for an Agricultural Survey of the State. It might be divided into the Eastern Shore, to be reported upon, we will venture to suggest, by such a man as Col. N. GOLDSBORO. The Western Shore, upper *wheat* Counties, by Mr. STABLER of Montgomery, the hay region around Baltimore, by Dr. G. B. SMITH, and the *tobacco* region by W. W. BOWIE, Esq. Such reports, on the Agricultural practices and resources of the several Counties, would be of more real value than all the party wrestling for the next two months at Annapolis, just to see which party can get the "back-lock" on the other. For all the time that is thus spent in party wrangling and maneuvering, the people—the Farmers—must pay, while, for a full development of the Agricultural condition and wants of the State these partisan leaders, calling themselves legislators, would refuse to appropriate a dollar, and that for fear of *losing their popularity with their agricultural constituents!*—So we go! humbugged and demagogue-ridden to the end of the chapter! The wisest man who would seek the popular support, with views exclusively to the general welfare, would be laughed at as a greenhorn! Hence has party spirit been called "the madness of the many, for the benefit of the few."

PRICES CURRENT.

[*Corrected, November 22, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort.....℔ 100 lb.	3 81½	@ 3	87½
Pearls, 1st sort, '45.....	— —	@ 4	31½
BEESWAX—American Yellow	— 30	@—	30½
CANDLES—Mould, Tallow..℔ lb...	— 9	@—	11
Sperm, Eastern and City.....	— 27	@—	38
COTTON—From.....℔ lb.	— 6	@—	9½
COTTON BAGGING—American...	— 12	@—	13
CORDAGE—American.....℔ lb.	— 11	@—	12
DOMESTIC GOODS—Shirtings, ℔ y.	— 5	@—	11
Sheetings.....	— 6½	@—	15
FEATHERS—American, live.....	— 28	@—	32
FLAX—American	— 7½	@—	8
FLOUR & MEAL—Genesee, ℔ bbl.	7 —	@—	—
Troy.....	7 —	@—	—
Michigan	7 —	@—	—
Ohio, flat hoop	7 —	@—	—
Ohio, Heywood & Venice.....	7 12½	@ 7	25
Ohio, via New-Orleans.....	6 37½	@ 6	50
Pennsylvania.....	— —	@—	—
Brandywine.....	6 50	@—	—
Georgetown.....	6 50	@—	—
Baltimore City Mills.....	6 50	@—	—
Richmond City Mills.....	7 25	@ 7	50
Richmond Country.....	6 50	@—	—
Alexandria, Petersburg, &c.....	6 50	@—	—
Rye Flour	4 37½	@ 4	50
Corn Meal, Jersey and Brand.....	3 75	@ 4	—
Corn Meal, Brandywine.....hhd.	— —	@—	—
GRAIN—Wheat, Western..℔ bush.	1 35	@ 1	40
Wheat, Southern.....new	1 30	@ 1	40
Rye, Northern.....	— 80	@—	85
Corn, Jersey and North...(meas.)	— 82½	@—	85
Corn, Southern.....(measure)	— —	@—	—
Corn, Southern.....(weight)	— 80	@—	82½
Oats, Northern.....	— 50	@—	—
Oats, Southern.....	— 45	@—	46
HAY—North River.....bales	— 75	@—	80
HEMP—American, dew-rotted.. ton	80 —	@95	—
" " water-rotted.....125	—	@175	—
HOPS—1st sort, 1845	— —	@—	35
IRON—American Pig, No. 1.....	37 50	@40	—
" Common.....	27 50	@32	50
LIME—Thomaston.....℔ bbl,	1 —	@—	—
LUMBER—Boards, N.R., ℔M. ft. clr.	35 —	@40	—
Boards, Eastern Pine.....	10 —	@11	—
Boards, Albany Pine.....℔pce.	— 8	@—	18
Plank, Georgia Pine.....℔M. ft.	33 —	@40	—
Staves, White Oak, pipe.....	48 —	@—	—
Staves, White Oak, hhd.....	38 —	@—	—
Staves, White Oak, bbl.....	30 —	@31	—
Staves, Red Oak, hhd.....	30 —	@—	—
Hoops.....	25 —	@30	—
Scantling, Pine, Eastern.....	14 —	@16	25
Scantling, Oak.....	30 —	@35	—
Timber, Oak.....℔ cubic foot	— 25	@—	37
Timber, White Pine.....	— 18	@—	25
Timber, Georgia Yellow Pine	— 30	@—	35
Shingles, 18 in.....℔ bunch	1 75	@ 2	—
Shingles, Cedar, 3 feet, 1st quality.	— —	@24	—
Shingles, Cedar, 3 feet, 2d quality.	20 —	@22	—
Shingles, Cedar, 2 feet, 1st quality.	— —	@17	50
Shingles, Cedar, 2 feet, 2d quality.	15 —	@16	—
Shingles, Cypress, 2 feet.....	11 —	@13	—
Shingles, Company.....	— —	@29	—
MUSTARD—American	— 16	@—	31
NAILS—Wrought, 6d to 20d...℔ lb.	— 10	@—	12½
Cut, 4d to 40d.....	— 4	@—	4½
PLASTER PARIS—℔ ton.....	2 62½	@—	—
PROVISIONS—Beef, Mess, ℔ bbl...	8 —	@ 8	25
Beef, Prime, ...	5 —	@ 5	25
Pork, Mess, Ohio, new.....	14 12½	@—	—
Pork, Prime, Ohio, old and new..	10 25	@10	62½
Lard, Ohio.....℔ lb.	— 8	@—	8½
Hams, Pickled.....	— —	@—	—
Shoulders, Pickled	— 5½	@—	5¾
Sides, Pickled.....	— —	@—	—
Beef, Smoked.....℔ lb.	— 7½	@—	8
Butter, Orange County	— 18	@—	20
Butter, Western Dairy.....	— 15	@—	17
Butter, ordinary.....	— 12	@—	14
Cheese, in easks and boxes.....	— 7½	@—	8½
SEEDS—Clover.....℔ lb.	— 10	@—	10½
Timothy.....℔ tierce	15 —	@16	—
Flax, Rough.....	10 —	@10	12½
SOAP—N. York, Brown.....℔ lb.	— 4	@—	6
TALLOW—American, Rendered...	— 7½	@—	7¾
TOBACCO—Virginia.....@ lb.,	— 3	@—	6
North Carolina.....	— 3	@—	5
Kentucky and Missouri.....	— 3	@—	7
WOOL—Am. Saxony, Fleece,.℔ lb.	— 38	@—	40
American Full Blood Merino	— 36	@—	38
American ½ and ¾ Merino.....	— 30	@—	33
American Native and ¼ Merino...	— 26	@—	28
Superfine, Pulled.....	— 29	@—	31

MONTHLY

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A NEW-YEAR'S OFFERING TO OUR PATRONS.

IMPORTANT TO ALL OWNERS OF CATTLE.

A VERY remarkable discovery has been made in France, in a department of rural Industry, which, could a word be coined for the occasion, might perhaps most aptly be called LACTEOLOGY, or COW-OLOGY, as it discloses infallible signs for determining the *milking properties of Neat Cattle.*

By these external marks, which are described by the author of the work, and illustrated by numerous engravings, now in course of preparation for the FARMERS' LIBRARY, it is maintained that one may without fail discover, even in a calf of a few months old, whether it will make a good milker, and is, therefore, worthy of being reserved for the dairy; or, if otherwise, it should be consigned to the butcher. Strange as may appear such a discovery, and the establishment of an infallible system based upon it, it yet seems to have been in very many cases subjected to the severest test, by committees of men of the highest character in France, appointed by and belonging to the agricultural section of the Academy of Sciences, who have certified in the most unequivocal manner to the truth and great value of the discovery. The testimony of scientific men of that grade and association, in France, it need not be added, challenges universally, public respect and confidence. We consider ourselves fortunate in being, by a lucky chance, made the medium of first proclaiming this French discovery to English readers; and, moreover, feel justified in referring to it as another proof that, acting under the instruction of liberal Publishers, *no trouble or expense* will be allowed to stand in the way of our fulfilment of all the promises with which the FARMERS' LIBRARY was offered to the patronage of American Agriculturists.

While waiting for the illustrations, in the hands of the engraver, and which will be numerous and costly, we offer here the "PREFACE OF THE TRANSLATOR," N. P. TRIST, Esq. of the State Department, a gentleman well known, and wherever known respected, for high character, learning and discernment; and who, previously to his acceptance of the office he so well fills, had been in a position which led him to give much attention to such subjects.

It has so happened in corroboration of all that is said in relation to this extraordinary discovery, that since writing so far, we find it particularly noticed in a late number of the "*Journal d'Agriculture Pratique et de Jardinage,*" sent to our Publishers by Doctor LARDNER, now in Paris.

Some extracts from that notice on the spot where the theory has been promulgated, may serve to rivet still stronger the attention of the reader:

"Monsieur GUENON, a farmer of Libourne, having discovered an infallible method of ascertaining the lactiferous properties of cows, by means of certain invariable signs, easily to be found on these animals, invited a rigid investigation of his theory, by the Agricultural Society of Toulouse. A committee was accordingly appointed by that Society, who reported:

"We conducted Mr. Guénon into seven cow-stables with which he was entirely unacquainted. Here forty-six cows were submitted to his inspection. In twenty-two instances he named the *exact number of pints given by each cow;* in fourteen he came within a pint, and in ten within two or three pints.

"Exact precision as to number of pints, however, is deemed as of little importance, as the quantity of milk is liable to vary, with many circumstances, as food, temperature, date of calving, &c. But the main fact of the discovery we *consider as established,* as Monsieur Guénon invariably distinguishes the good from the bad milkers.

"From this fact, with which the committee was much struck, there results the consequence that there is really a relation existing between the milking properties and the visible external signs or escutcheons indicated.

"The Committee consider as a vast service rendered to Agriculture, a discovery which has taught us to distinguish good from bad milkers, and it is the greater as the system applies to calves, and thus enables us to discard, by handing over to the butcher, worthless heifers, that we would otherwise be at the expense of rearing.

"To make known as widely as possible *this valuable discovery*, the Committee recommend the nomination of Mons. GUENON, as a corresponding member of this Society and the purchase of 25 copies of his work."

Let us take the occasion to salute our patrons with "a happy new year." We are grateful for their liberal encouragement, and if they are not as numerous as we could wish, they are quite as much so as as we could have reasonably expected, and will make up in quality for want of numbers. Finally, we have every reason to be grateful for the past and confiding as to the future—and all we have now to ask is, that those who think favorably will speak kindly of our labors to advance the most important interest of the country.

TREATISE

ON

MILCH COWS:

WHEREBY

THE QUALITY AND QUANTITY OF MILK WHICH ANY COW WILL GIVE MAY BE ACCURATELY DETERMINED,

BY

OBSERVING NATURAL MARKS, OR EXTERNAL INDICATIONS ALONE;

THE LENGTH OF TIME SHE WILL CONTINUE TO GIVE MILK,

&c. &c.

BY M. FRANCIS GUENON, FRANCE.

Translated from the French of the Author, for the Farmers' Library,

By N. P. TRIST, late U. S. Consul at Havana.

TABLE OF CONTENTS:

TREATISE ON MILCH COWS.

THE TRANSLATOR TO THE READER.

Nonsense! Who can believe any such thing? What! by merely looking at a cow, to be able to tell how much milk she is capable of being made to yield; and, also, how long she can continue to give milk after being got with calf!—to be able thus to ascertain, not only what are the qualities of a full grown cow, but what are to be the qualities of any heifer-calf, by looking at her while yet but two or three months old! Surely, if ever there was a humbug, this is one.

Softly, Mr. Reader! You are very incredulous, no doubt, but I defy you to be more so than I was when in your present position. What is more, I defy you to cling to your skepticism over an hour or so. However strong and firm it may be at this moment, it will, in a little while, have vanished into nothing; and its place will be filled by another solid proof in addition to the many you must already have stored up, that

> "There are more things in heaven and earth ——,
> Than are dreamt of in your philosophy."

When this discovery was first mentioned to me, as one which had recently been published in France, I smiled at the credulity of some people. My informant, perceiving what effect the announcement had upon me, said, "It is so, however;" and then, nothing but politeness toward a stranger, for the first time under my roof, prevented my replying, "You do not really believe this to be possible."

He offered to send me the book; and, though I had not the least idea of throwing away my time in reading it, civility would not allow me to decline. It came, and I opened it with the intention merely of looking into it sufficiently to say that I had done so. When, however, in turning the pages over, I saw that this piece of quackery, as I felt very sure the pretended discovery must be, had engaged the attention of distinguished Agricultural Societies in France, and had earned "Gold Medals" for its author, in a country where they are not prone to be lavish of such substantial marks of approbation, my curiosity was awakened, and I had soon read enough to bring home to me once more, for the thousandth time, that homely old truth, "We live to learn."

Since then, many things have occurred to strengthen my confidence in the reality of this discovery, and in its high practical value to all interested in the preservation and improvement of milk stock—and who is it that is not interested in its productiveness? The most recent of these incidents is as follows:

A friend to whom I had lent the translation accompanied with the plates which are requisite to make it intelligible, showed it to a man from the country whose calling had rendered him quite conversant with the subject of cattle. This person's curiosity was so far awakened, that, beside attending to the explanations made to him, he took a sketch of some of the *escutcheons*. After an absence of some weeks, he returned to the city where this had happened, and came to see my friend. "That thing (said he) is as true as a book. There is no mistake about the matter. Since I was here, I have looked at more cows than ever you saw, and I am perfectly satisfied that the thing is just as the Frenchman says. I have become convinced, too, of another thing: that our breeds of cattle are by no means the great things they are cracked up to be." N. P. T.

☞ This important Treatise will be continued in the February Number of this Work.

THE MARYLAND FARMERS' CLUB.

ON THE RIGHT TACK.

We have already more than once expressed our humble persuasion of the utility of Farmers' Clubs; and feel much gratified in the belief that they will spring up and do good service in all parts of the Union.

The one which has been recently formed at Baltimore, Md., has started right foot foremost, by taking effectual measures to promote *intellectual inquiry and scientific investigation into matters of obvious importance.* The results of such investigations bring new facts to light, lift Agriculture from the mire, cause it to be respected as a pursuit worthy at once to task and to amuse the mind of the scholar and the man of science; and according as it is pursued in that spirit, to augment the best sort of stock, that man can covet or possess—*the stock of knowledge.* We rejoice to know that we shall see, from time to time, the proceedings of this respectable Club in their "*organ,*" the old American Farmer; which, by the bye, has come out in new and fashionable attire, looking as fresh and vigorous as an old fruit tree recently and judiciously pruned and washed over and scrubbed with soap suds and *sands!* The Club could not have a better Repository for their good works. We would gladly copy all their proceedings as we find them in the Baltimore Patriot, but that cannot be expected of a work like this, intended so much more for the promulgation of principles than for the register of details.

We tender our thanks to the Club for their compliment in recommending the Farmers' Library, and with the blessing of Providence, and the *liberality of our Publishers,* who restrict us in nothing, *we mean to deserve it.* The following item of their proceedings, however, presents such a prominent feature, and is so much in a spirit that we have been earnestly commending, that we take leave to hold it up as worthy of imitation:

"On motion of Danl. Bowly, Esq. it was resolved, that the regular subject for discussion at the next meeting be the disease now making such havoc of the potato throughout the world, that if possible, its farther spread in Maryland may be stayed—and, to this end, that the Chemists and Geologists of the Club, Professors Ducatel and Baer, be each requested to procure at least one pound of potatoes in this state of peculiar disease, and to select at least one pound each of those in a perfectly healthy condition, for analyzation; that they each be authorized to conduct and complete a separate analysis of both descriptions; furnish the particulars at the next meeting of the Club, and accompany the same with an opinion, in the abstract, as to whether it be an internal disease, and if so, what remedy may be applied, and whether it be microscopic animalculae, and if so, whether in the pupæ or larvæ state, and what measures, in their opinion, should be adopted to prevent its generation—or, if it be a parasitic superficial fungus—also that $50, $12 50 for each separate analysis, or so much thereof as may be needed, be appropriated out of the funds of the Club to defray the expenses of said analysis."

Here, then, the reader sees that these gentlemen are not satisfied to take all out in talking. They designate an important subject, call upon the Chemist and the Geologist "*of the Club,*" and put their hands in their pockets to defray the expense of the required analyses, and we doubt not their reports will be of more real service to the cause of Agriculture, than would an exhibition of twenty of the fattest cattle ever reared and stuffed on the "South Branch." We shall keep a look-out for these reports, to publish and send them to the distinguished Commissioners engaged in precisely the same investigations in Ireland, but *there* at the *instance of the Prime Minister,* Mr. Peel, and doubtless to be munificently compensated. And so should all such men, so engaged, be compensated.—Their Geological and their Chemical knowledge *is their trade,*—acquired at great expense of money, time and labor. Their crucible is to them what the anvil is to the smith, and the plow to the farmer, and the sword to the military man—with *this exception, that* the *Government* gives the sword and *a life commission and high pay along with it,* whether it be used or not; and with one other exception—the crucible, the anvil and the plow are instruments of *knowledge and support,* the sword for the *slaughter of the human family.*

That noble friend of Agriculture—noble in the best sense of the word—the late Earl Spencer, at a general meeting of the Royal Agricultural Society of England, especially recommended the formation of *Farmers' Clubs,* on the ground of their coming home, as it were, to the fireside of the practical farmer, who would not go to an Agricultural Society's dinner; but in their Clubs he said they might meet their neighbors, and talk over in their own plain way all the new improvements which they have themselves adopted, or seen elsewhere.

FARM BUILDINGS.*

THEIR LOCALITY AND CONSTRUCTION.

THESE, it is quite obvious, should be determined with reference to the objects for which they are designed; and these objects vary according to the climate and staples of the country; while much depends, too, upon the size of the farm. Where capital will admit of it, the better economy would be, however, to adapt them to the full size of the farm, and no more; for although the good manager, the man of sagacity and industry, fond of his business and devoted to his domestic concerns, who begins on a small farm with adequate force or capital, may reasonably expect *to enlarge his estate*, and might venture to plan his Farm Buildings accordingly; yet, in the great majority of instances in our country, farms of more than 300 acres are more apt to be divided than enlarged. This depends, it is true, on the character—we speak of the industrial character—of the owner, and the means at his command. But, especially south of the Chesapeake, land so generally comes into possession encumbered with debt, or with capital and force altogether inadequate to its thorough utilization, that before the debts are paid off and the estate put in good condition, the owner pays the debt of Nature, leaving the wife and children to pay all his other debts.

Again: as to climate and staples, these, too, must have their influence in determining the plan of the Farm Buildings; for clearly what might be suitable and necessary on the small farms in New-England, where a good aggregate annual sale is made up out of notions—a few apples and eggs; a little butter and cheese; a few pounds of wool and feathers; a small nursery of fruit trees; a couple of fat cattle; a few hundred weight of pork, and a variety of odds and ends, for which every farm may find a ready market at a neighboring factory, demands a very different suite of buildings from a farm of much larger size, where the great staples are sheep, or cattle and mules, or hay, or grain, or tobacco, or cotton. But in general it may be laid down that Farm Buildings should be placed and planned with a view to the collection and preparation of the whole produce of the estate, whatever that may be, ready for the market, or for use and consumption on the place—either to sustain or fatten the domestic animals, or as food for the family—and, moreover, and no less important, for the purpose of *collecting, saving and preparing the manure* for the use of the estate in such manner that the full equivalent of all that is taken from the land shall certainly be restored in some equivalent form and substance.

On some former occasion we have remarked on the too common want of system in the arrangement and plan of these buildings, they being, as well as the gathered crops themselves, scattered here and there, without relation to each other, or any plan of economy in the use of them. How often have we seen, for the sake of some momentary convenience, the hay stacked, sometimes on the naked ground, along the sides of the meadow, and the wheat or fodder in like manner in a distant corner of the field—to be moved, load by load, from time to time, as it might be wanted, and wasted on the way, and the broken stack left in the mean time exposed to rain and snow, instead of having it all placed at once where the least possible after-handling and labor would be necessary to place it on the threshing-floor or in the manger.

The farmer should reflect, that it is impossible to handle any thing on his estate but *at some expense!* Time is money, and there is a money value in every five minutes of every machine on his farm, especially animal machines, whether man, horse, or ox.

With inanimate machines, the cost of idle time is less, because they *eat* nothing; but men, women and children, and all other living and consuming beings on the place are sources of *constant* expense; and every fraction of time and of labor, that could be more economically applied, is a proper charge in that account of expense, which every farmer who values his character and his credit, should keep with all the scrupulous punctuality and exactness by which every respectable and intelligent manufacturer and merchant is at any moment enabled to see whether, and how much, he is going ahead or astern. To make every tittle of labor as *productive* as the nature of things will possibly admit, whether that labor consist in manual, in machine, in water, or in steam power, is the chief, the incessant study of the manufacturer. See how every pursuit except the American farmer's, has been advanced by *steam*. Some man, inspired by a contemplation of its uses and

* For a more minute description of the Farm Buildings illustrated in this No. see end of this article.

its power, makes it pour forth its song of exultation—"the song of steam," in which it boasts of its prowess in all else but in the business of the husbandman. How it travels over mountains, and distances the winds on the trackless and stormy ocean! But what boon does it bring, what service does it render, directly, to the farmer? It does not for him drain the inexhaustibly rich, but useless marshes of the sea-board; neither does it furrow the rootless and stoneless prairies of the West. The Government—our *people's Republican Government*—would give a million of dollars for a steam power that would *kill a thousand men at five miles' distance*, but not a V for a *steam-plow* that should add millions to national wealth and population. That would be *against the Constitution!!* But hear how steam boasts of its contributions to *other* interests—even the Printer's:

In the darksome depths of the fathomless mine
My tireless arm doth play,
Where the rocks never saw the sun decline,
Or the dawn of the glorious day,
I bring earth's glittering jewels up
From the hidden cave below,
And I make the fountain's granite cup
With a crystal gush overflow.

I blow the bellows, I forge the steel
In all the shops of trade;
I hammer the ore and turn the wheel
Where my arms of strength are made;
I manage the furnace, the mill, the mint,
I carry, I spin, I weave;
And all my doings I put into print
On every Saturday eve.

Returning to the point of economy in the arrangement of Farm Buildings, it is, as every reader will admit, by no means an uncommon thing to see the farmer's corn-house at a distance of some hundred yards from places where the corn is to be conveyed every day, and every grain of it ultimately consumed. Now, were that a part of the machinery of the manufacturer of flour, or of cloth, or of iron, you would see it so arranged, that between the gathering in the field, and the final use of it, one-half of the labor would be saved. Look with what magic-like celerity, quietness, and saving of labor, another grain is managed from the time it leaves the slow and slovenly processes of the farm, and touches the hand of the manufacturer. In the boat, on the wharf, *his* machinery takes up the *wheat*, passes it under the pavement, and without noise or confusion, or the touch of a hand, the beautiful flour is placed in the barrel!

Go into any walk of industry except farming and there you find the same economy of arrangement and of labor—the same ingenious contrivances of mechanical power; the same command over, and subserviency of the elements to give labor a supernatural productiveness. Economy of time and of labor, then, is one of the *great objects* to be studied in the location and adjustment of *farm buildings*—and economy furthermore in the use of the crop in its application to the sustenance and fattening of domestic animals. On this point much is to be accomplished by more or less *warmth* which may be secured by the site and arrangement of the farm-yard. In fact, the principal points to be attended to, are *warmth* which supposes good *shelter*, good dry bedding and pure water and pure air. While the common practice is to let cattle wander over naked fields through the winter months, exhausting their substance by exposure in gleaning, with great exertion, the merest fraction of nourishment, nothing is better understood by all who have given the least attention to the progress of agricultural knowledge than the well ascertained fact that *warmth and food* are in a large degree synonymous.

Writers of the highest authority lay down as *axioms*—that to leave animals to pasture in the *cold* air is to leave them to struggle with the climate for their *existence;* and that, so circumstanced, they can never improve to anything like the extent to which they would improve if properly protected.

And furthermore—that to fatten animals on principles of rational economy, they must be placed in situations, in which they may not only have suitable food, but also *warmth* and *rest;* and that being fattened they should never be fatigued or in any way annoyed, as all fatigue leads to a diminution of fat. On this point of *temperature* LIEBIG is clear and explicit:

"The manifestations of the vital force are dependent on a certain temperature. Neither in a plant nor an animal do vital phenomena occur when the temperature is lowered to a certain extent. The abstraction of heat must be viewed as quite equivalent to a diminution of the vital energy. When the temperature sinks, the vital energy diminishes, (unless supplied with a corresponding excess of food.) Our clothing [or warmth from any cause] is *merely equivalent for a certain amount of food.* The more warmly we are clothed, the less urgent becomes the appetite for food; because the loss of heat by cooling, and consequently the amount of heat to be supplied by the food, is diminished. If we were to go naked, like certain savages, or if, in hunting or fishing, we were exposed to the same degree of cold as the Samoydes, we should be able with ease to consume 10 lbs. of flesh, and perhaps a dozen tallow candles, as warmly-clad travelers have related with astonishment of these people. We should then also be able to take the same quantity of brandy or train oil without bad effects, because the carbon and hydrogen of these substances would only suffice to keep up the equilibrium between the external temperature and that of our bodies. According to the preceding exposition, the quantity of food is regulated by the number of respirations, by the temperature of the air, and by the amount of heat given off to the surrounding medium.

The reader will perceive that we are not undertaking to lay down a *plan* or to indicate the *particular arrangement* of Farm Buildings. All we have had in view here, has been to lay

down the general principle, that economy of labor in preparing the crops for market, and in administering such portions as are to be used on the farm, is to be regarded as a primary consideration. That they should be so constructed, too, as to afford warmth, good bedding, and a full supply of wholesome air and pure water; with the least exhaustion by exposure to cold air and to exercise in which no equivalent sustenance is obtained. Then another point of the highest importance is such arrangements, fixtures, and management, as shall tend to the *greatest accumulation of the best manure.*

Surely the farmers, or at least, we are proud to believe, such farmers as patronize this work, are not now to be reminded of a truth long maintained by Philosophers, that in this world *nothing is lost.* Many things change form, but all are reproduced. If their elements were destructible, the material world would be exhausted. It is the business of the judicious and vigilant farmer to have that reproduction, with what increase of fertilizing matter he can, take place on his own estate—to take care that every particle that his land lends for the support of his crops, shall be returned with interest—else may he abandon all hopes of improving it. If not restored it would be, in time, as certainly worn out as the material world would itself be if Providence had not taken care that, while every thing is changing form and falling into dissolution, nothing is *extinguished.* One spot catches what is lost by another, and the whole difference between good and bad management consists in the difference between restoring, or not restoring to one's land, those elements of fertility which are so constantly carried off, directly in the form of the corn, hay, straw, grain, tobacco, and other crops, which are sold off the farm, or indirectly, after these same articles have assumed the form of hogs, sheep, horses, cattle, poultry, &c. In explanation of this maxim of ancient philosophy, that nothing is lost, and of the practicability of restoring all to the Farm, hear LIEBIG again:

"One part of the crops employed for fattening sheep and cattle (he observes) is consumed by man as animal food; another part is taken directly as flour, potatoes, greens, vegetables, &c.; a third portion consists of vegetable refuse and straw employed as litter. None of these materials of the soil need be lost. We can, it is obvious, get back in the solid and fluid exuviæ of men and animals, and in the bones, blood, and skin of slaughtered animals, all the constituent ingredients of the consumed food, soluble and insoluble. It depends upon ourselves carefully to collect all these scattered elements, and to restore the disturbed equilibrium of composition in the soil. We can calculate exactly how much, and which of the component parts of the soil we export in a sheep or an ox, in a quarter of barley, wheat or potatoes, and how much we have to supply to restore what is lost to our fields. * * * * * * If the manure supplies an imperfect compensation for this loss, the fertility of a field or of a country decreases; if, on the contrary, more is given to the fields, their fertility increases. An importation of urine or of solid exuviæ from a foreign country is equivalent to an importation of grain and cattle; for in a certain time the elements of those substances assume the form of grain or of fodder, then become flesh and bones, enter into the human body, and return again, day by day, to the form they originally possessed. The only real loss of elements we are unable to prevent is of the phosphates; and these, in accordance with the customs of all modern nations, are deposited in the grave. For the rest, every part of that enormous quantity of food which a man consumes during his lifetime, (say in sixty or seventy years,) and which was derived from the fields, can be returned to them. We know, with absolute certainty, that in the blood of a young or growing animal there remains a certain quantity of the phosphate of lime, and of the alkaline phosphates, to be stored up and minister to the growth of the bones and general bulk of the body; but that, with the exception of this very small quantity, we receive back, in the solid and fluid excrements, all the salts and alkaline bases, all the phosphate of lime and magnesia, and consequently all the inorganic elements which the animal consumes in its food; and what is not thus directly given back, the air takes up and gives back.

As to the arrangements of the barn-yard with an eye to the *preservation of manure.* Although we are fully impressed with the value of every quart of liquid manure, and think it a just subject of reproach to every farmer who loses one drop that he can save, we have our doubts about the expediency of building *tanks,* for the use of ordinary farmers. Doubtless it would be very desirable, and ought to be provided for by those who have the means; but we apprehend there must be much expense in the beginning and more labor in lifting and spreading than most farmers in this country can afford.

On the subject of manure, its management and preservation, we think the considerations in the following extract are worthy of all attention:

"For the successful preparation of this indispensable material without waste, all are agreed that it should be protected from the weather, and that all the animal excrements, liquid and solid, should be preserved in it. For this purpose, again, a covered area seems much better adapted than open yards in which the sun, wind, and rain, rob the farmer of many a pound in the course of the year On the contrary, where the liquid manure is conveyed to a proper receptacle by underground drains, and the solid parts are constantly carried to a proper spot which is covered over, no loss of valuable matter is sustained. The system of running the liquid manure into underground tanks has been much recommended, but when collected in these it requires much labor to pump it out again, and mix it with some porous material, such as dry earth, ashes, dung, &c.; besides the outlay in forming the tanks, and the wear and tear of pumps constantly liable to corrode and become choked. Hence it appears to me, that the best arrangement would be to secure such a fall from the cattle sheds,

stables, piggery, &c., that the liquid manure should deliver itself above the top of the heap of dung, compost, weeds, &c., which should be placed ready to absorb the liquid manure in a receptacle hollowed out and prepared for the purpose, and roofed over."

To evince our estimate of the importance of this subject, and that the Publishers of this journal in their liberality, restrain us in *nothing which may be deemed useful to its patrons*, the plan of Mr. Wilkinson's barn, and appendages, has been illustrated. We understand it has met the approbation of the State Society, but we offer it to speak for itself.

Those, if any, who think it deficient in principle or details, will soon have an opportunity of displaying their taste in attempts at a better one. *We are authorized by the Publishers of the* FARMERS' LIBRARY *and* MONTHLY JOURNAL OF AGRICULTURE *to offer a piece of plate (value $33) with suitable inscriptions, for the best plan, with all the requisite drawings for a Farm House and Buildings, to be adapted to the Eastern, the Middle and the Southern portions and products of the Union.* This general notice may suffice until, in the next number, a more particular specification may be given.

They will offer, also, a handsome piece of plate of like value for the best essay on the Natural History of the Tobacco plant and its entomological enemies, to be accompanied with a drawing and a dissertation on the culture and curing of the plant. The same as to *Hemp, Hops, Rice and the Sugar-Cane.*

DESCRIPTION OF WILKINSON'S PLAN OF FARM-BARN, SHED, &c.

[*See Diagram at the commencement of this Number.*]

Fig. 1. Elevated View.
Fig. 2. Plan of Lower Floor.
Fig. 3. Plan of Upper Floor.

DESCRIPTION OF FIRST FLOOR, FIG. 2.

First Floor.—A, The North Shed, 26 by 80 feet. 1, 1, 1, An Alley 5 feet wide, leading from the basement of the barn to the cattle stable. 2, A Straw Bay, 21 by 18 feet, open to the threshing and cleaning floor and barn-yard through the door A. 3, 3, 3, &c. Cattle-Stalls, 5 by 11 feet, separated by double partitions, with a door the whole width of each. 4, A space 12 by 21 feet, with high half-doors, in which to drive with leads of hay to fill the loft over the cattle stable; likewise to be used as a Calf-Pen; having nearly its whole area exposed to the sun, when the upper doors are open. 5, 5, Open Shed, containing 480 square feet. 6, 6, 6, &c. Box-Mangers for hay, 2 by 3 feet 7, 7, 7, &c. Boxes for roots and grain, 2 by 2 feet.

B, The Ground Floor of the Barn. 1, Grain Cleaning floor, 22 by 30 feet. 2, Granary. 3, Vegetable Cellar, 18 by 22 feet; with three trap-doors in the second floor over it into which to tip the roots or vegetables in separate bins. 4. Cistern, 12 by 16 feet, from which the water is drawn by a two-inch iron pipe running through the east wall of the cistern and the siding of the barn, the outlet of which is about 18 inches from the ground by the side of the barn where it falls into a large trough for watering the cattle in the yard, or the water might be conveyed by means of a pipe to all the stalls of the stables if preferred. The water escapes by lifting a valve perpendicularly off from the end of the pipe by means of a cord running to various parts of the barn, in order that the water can be drawn from the cistern at any time from any part of the barn. The bottom of the cistern is a little above the floors of the basement, so as to have but one pipe to draw off all the water when the cistern is to be cleaned. The pipe is laid in the current in the bottom of the cistern until it reaches the lowest place in the bottom, where it has a right-angle elbow; thence running perpendicular to the surface of the bottom, where the end of pipe is squared or trued by filing, so that a leathered leaden valve will make a water joint. 5, Hall, 4 by 16 feet. 6, Carriage House, 27 by 30 feet. 7, Stairs leading from cleaning to threshing floor. 8, Stairs from lower hall to second floor.

C, The East Shed, 26 by 62. 1, 1. Alley leading from barn-yard to front of cattle stalls. 2, 2, 2, &c. Cattle-Stalls, 5 by 11 feet, with door the whole width of the stalls. 3, 3, 3, &c. Box-Mangers for cattle, 2 by 3 feet. 4, Boxes for roots and grain, 2 by 2 feet. 5, Open Shed, containing 350 square feet. 6, Entrance to *Henery*. 7, Stairs, 3 feet wide, leading from carriage house and stable to the Hay Loft. 8, Entrance to Harness Closet under the stairs. 9, Platform to place the measure on, under a leader from the grain bin in the hay loft. 10, 10, 10, &c. Horse Stalls, 6 feet wide, with semi-circular racks for hay. 11, Horse Stalls, and house for lumber wagon only. 12, Doors by which to enter from either way with a wagon, or to drive through. 13, Trap-Door to Vault for horse manure.

DESCRIPTION OF THE SECOND OR UPPER FLOOR, FIG. 3.

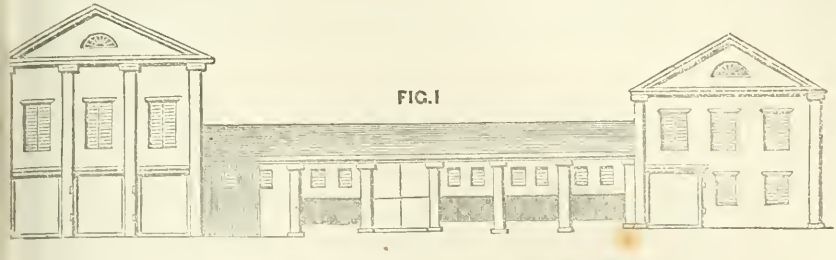
A. The North Shed. Æ, A door through which to throw the straw from the threshing floor 2. into the Straw Bay. B, Landing of stairs from the Straw Bay to Hay Loft. C, An open space that may be used for mow room, after the shed is filled, by placing poles across from mow to mow. It may be filled from the upper half-doors G.

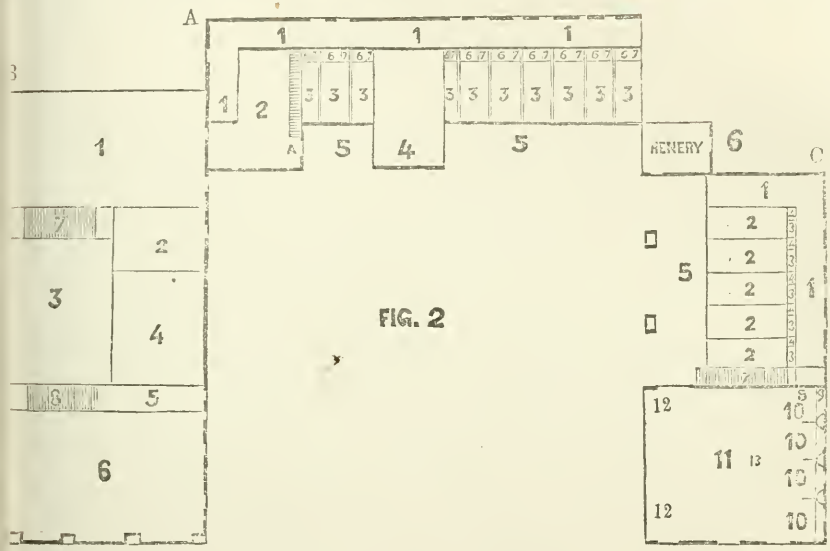
B, The Barn. 1. Crib Floor, 3 by 30 feet. 2. The Threshing, grated cleaning floor, 22 by 30 feet. 3, Grain and Hay floor, 27 by 30 feet. 4. Mow, 27 by 30 feet. 5 and 6, Stairs leading to the lower floor. A, A, A, Trap-Doors over Vegetable Cellar. C, Trap-Door to enter the Cistern. E, Trap-Door over the lower hall. The object of this trap-door is to drop the fodder from the barn floor, or large mow over carriage house, into the lower hall, to be foddered in the yard without exposing it to be trodden under foot by the cattle in the yard. This floor is on a level with the ground on its western entrance.

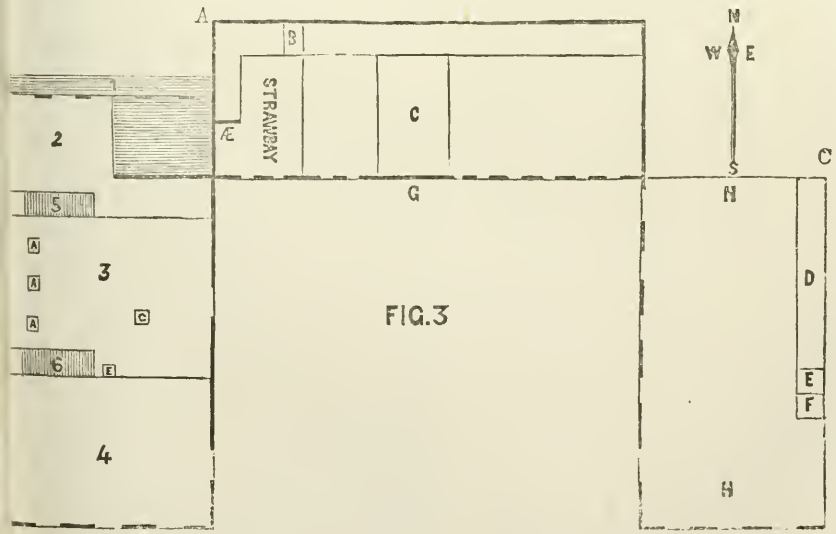
C, The East Shed. D, An open space, the same as in the north shed. E, The landing of the Stairs from the wagon house and stable below. F, Oat-Bin in the hay-loft. H, H, Hay-Loft, 26 by 62 feet.

WILKINSON'S PLAN OF A BARN, SHED, &C.

For a Description see page 332 of Monthly Journal of Agriculture.







THE MODE IN WHICH LIME OPERATES

IN RENDERING THE SOIL BETTER ADAPTED FOR THE GERMINATION AND GROWTH OF PARTICULAR PLANTS.

BY ROBERT M'TURK, ESQ., OF HASTINGS HALL, DUMFRIESSHIRE.

[Premium, the Silver Medal.]

[A FAVORITE practice in Maryland, where clover is much relied on for restoring worn-out lands, and for maintaining the strength of such as have been recruited, is to sow the clover-seed on the snow, in February, and leave it without any covering except what it gets by sinking into the ground, on the melting of the snow and the alternate thawing and freezing in spring—otherwise it is sowed, in like manner, on the surface, later in spring, but generally before the cessation of frost. Sometimes, as was the case last spring, the young clover is killed by a severe frost occuring just when the young clover is coming up, but generally this system of sowing appears to answer well. It is usually on the young wheat or oats—harrowing is sometimes resorted to but very rarely. Where the land is light it is deemed advisable to roll the clover-seed which may serve to give more compactness to that sort of land, liable as the young grain crop is to be injured by the March winds. It would seem clear from the experiments here detailed, that covering the seed is not necessary to its germination, and that when it is done, it cannot be done too lightly.]

THERE is no substance, perhaps, so extensively used for agricultural purposes, with regard to whose ageney, and the time of applying it to the soil, the opinions of practical men have differed so widely as that of Lime; for, while it has been, and, I may say, is at the present time, regarded by one class of agriculturists as a manure, it is by another, and, perhaps, not the worst-informed class, regarded merely as a stimulant; that of itself it contributes almost nothing to the growth of plants, and that the benefit resulting from the application of it to the soil is owing entirely to the action which it exerts upon other bodies which it encounters in the soil. It would not be difficult to show that lime, like the other earthy bodies, enters so sparingly into the constitution of plants, that its presence, in many whose growth it promotes, can, upon analysis, with difficulty be detected, and we are, therefore, entitled, perhaps, to regard its presence, on some occasions, as accidental rather than as a necessary constituent.—Were Lime really entitled to be regarded as a manure, we are inclined to think that its effects would be less evident than they really are, especially when we take into consideration the very small proportion in which it is found to exist in those plants which are considered as most worthy of cultivation, and for promoting the growth of which it is most frequently applied. To what, then, are we to attribute the increased fertility of these soils which have reeeived a due proportion of Lime? Most eertainly not to the influence which it exerts over the earthy bodies which constitute the soil, these being saturated metallic oxides, which have no affinity for it. Nor has Lime an affinity for any of the elements which they contain; and, if the soil did not contain other ingredients, upon which it powerfully acts, its application would be followed by no beneficial results. These ingredients are the remains of bodies which have lived and died, and still, in some degree, retain their organization; and, in proportion to the quantity of decomposable matter which they contain. and the causticity of the Lime when applied to them, will be the effect produced. If, then, the aetion produced by the Lime depends so much upon the state in which it is applied, it is also proper that we should mention that its causticity depends, *first*, upon the freeness from other earthy matters, or, in other words, its purity; and, *secondly*, on the time that is allowed to elapse between the burning and the application; the burning being simply the means by which the carbonic acid is expelled, and the Lime being thereby changed from a mild to a eaustic state, or, as it is called, quick-lime. Water is then applied, for the purpose of slaking or pulverizing it, in order that its distribution over the land may be more equal, and effected with greater facility. But, from the time it is cooled, after it comes from the kiln, its affinity for carbonic acid gas is very strong, and it will continue to attract it from the atmosphere till it is again united to a proportion equal to what was expelled by the operation of burning; and if this is allowed to take place before it is applied to the soil, it returns to a state comparatively inactive, and, in proportion as it has been allowed time, and placed under circumstances favorable for attracting carbonic acid gas, it will lose the power of acting upon, or disorganizing the animal or vegetable remains which it encounters in the soil, and also of neutralizing any acidulous matter which may there exist.

We shall now endeavor to explain the nature of the action which Lime exerts upon the organized matter it encounters in the soil, and in what manner this action tends to promote the generation and growth of particular vegetables.

When a plant dies, it leaves its roots in the soil; and the roots of some plants occupy a much larger space than a person unacquainted with their growth may suppose. The softer and more juicy parts begin to rot or to be de-

composed—which, in fact, is the loosening of that mysterious influence by which the elements of all organized bodies are held together as long as life endures; and the process of decomposition of any animal or vegetable substance is, therefore, simply the restoring to nature those substances, in their elementary forms, which it at first received from *the soil or atmosphere*—and this process goes on with more or less rapidity according to the nature of the substance, and the circumstances under which it is placed. Although it is a well-established fact that putrefactive fermentation, or the process of decomposition, cannot take place unless in a temperature of above 32° Fahrenheit, a free admission of the atmosphere, and a certain degree of moisture; still these agents are always present in the soil, within a moderate depth from the surface, and under circumstances sufficiently favorable to effect the decomposition of the softer and more juicy parts of animal and vegetable substances; but when their decomposition has taken place, the more solid parts still remain, and these, with the yearly contribution afforded by the more recent plants, constitute an inexhaustible source of organized matter from which, by well-directed skill and industry, man may derive his means of subsistence. In this beautiful provision of nature, we find that, when man commits to the earth the remains of animal or vegetable bodies, he not only secures a present nourishment to crops which supply his own immediate wants, n the more decomposable parts of those remains, but has also laid up a bountiful store for those of his race who will take his place on earth when his labors are over. Lime, then, is an agent which enables us to avail ourselves of the hidden stores of nourishment which the soil contains; for, when it is applied to the soil in its caustic state, it is washed in by showers of rain, and, in its progress through the soil, encounters a portion of inert, insoluble, but decomposable matter, which it acts upon in such a manner as to effect its decomposition, and resolve it into three parts essentially different in their nature and character, all which parts are contained in the smallest portion that can be decomposed—*first*, the gaseous; *second*, the soluble; and, *third*, the residuary matter. It is the two first of these we are to regard as the immediate cause of the increased fitness of the soil for the germination and growth of particular plants.

First, then, with regard to the germination of particular seeds, and there is none with regard to which it is more remarkably the case than that of white clover, and at the same time, there is no plant more desirable to be obtained.—When Lime is applied to the surface of pasture land of so inferior quality that clover has not before made its appearance, and, if the land is not so wet as to counteract the influence of the Lime in the course of the second year after its application, white clover is almost certain to appear. It is evident from this that the seeds of the clover must have been in the land before it was limed, as the calcination of the Lime completely precludes the possibility of the Lime itself being the medium through which they have been conveyed. How long the seeds may have lain there, without their vital principle being destroyed, we have no data to form an estimate; but we know they must have been there from a very remote period, and their coat must be of a very impervious nature, to have prevented germination, and to have protected it so long from injury; for germination, like decomposition, requires a certain temperature, and the seed to be in contact with moisture and the atmosphere; and the rapidity of the process, in these circumstances, depends upon the temperature, so long as it does not exceed 100° of Fahrenheit.—When Lime, then, commences its action upon decomposable matter, a portion of gas is disengaged, which penetrates the soil above it, and is partly absorbed by the soil, and partly makes its escape to the atmosphere; and, as decomposition proceeds, the soil becomes looser and more permeable to the atmosphere. The temperature is, at the same time, increased by the more ready admission of the sun's rays, while the heat, which is always evolved in the process of putrefaction, stimulates the seed to absorb moisture, and, at the same time, oxygen from the atmosphere, which now finds ready admission through the now permeable soil. The germination of the seed is thus effected which had lain for ages in the soil, and might have continued so for ages to come, had the action of Lime on the decomposable matter not rendered the superincumbent soil porous, by which the atmosphere was admitted, and the oxygen, its vivifying principle, absorbed, and the temperature raised by the ready admission of the sun's rays, and the heat evolved during decomposition.

The next point for consideration is the manner in which Lime promotes the growth of particular plants. Although the seeds of some plants are covered with a coating so impervious to moisture and the atmosphere as, when buried in the consolidated earth, germination cannot take place without the agency of some powerful stimulant, such as Lime, still we are acquainted with no plant of which it does not in some degree promote the growth. It is true that, when applied to land, some of the plants which before occupied the surface disappear, but it is doubtful whether this arises from anything in the Lime which is deleterious to such plants, or whether its action has so powerfully promoted the growth of others, that their increased luxuriance proves fatal to those of weaker character; and, if pasture is allowed to become too tall and rank for two or three summers together, the white clover, which indicated the improvement of the land, is choked, and, the action of the Lime having subsided, the germination of other seeds of the same plant does not take place.

When gaseous matter is disengaged by the action of Lime, the matter to which it has united itself is partially rendered soluble in water; and it is a truth, which requires no illustration, that no substance of any kind can be received as nourishment by plants which has not, in the first instance, been dissolved in water, the mouths of the roots being so very small as not to admit the point of the finest needle. It farther seems to be a law of nature that organized substances cannot again form part of a living being without being in the first place disorganized; and in proportion to the quantity of the inert matter which the Lime has acted upon and rendered soluble, and also in proportion to the gaseous matter which has been evolved during the process, and been absorbed by the soil, will be the amount of nourishment or advantage resulting from the application of Lime. Although we have selected clover as the plant, the germination of which frequently follows the use of Lime, there are others over which it exerts an equal influence; but as its appearance is the surest indication of an important change having taken place in the soil, whether the Lime had been ap-

plied to improve the pasturage or to enrich the soil for the cultivation of other crops, the appearance of other plants is often overlooked, and some do not germinate till after the land is plowed and placed under more favorable circumstances, of which class of plants the dead nettle furnishes a good example.

There is another argument which we may advance, in support of this view of the germination and growth of clover, arising from the influence of draining. Where this improvement has been sufficiently made, so as to effect an amelioration of the soil, white clover is sure to make its appearance. This is owing exactly to the same change in the soil, in consequence of drainage, which we have ascribed to the Lime; for when superabundant moisture is withdrawn, plants of a semi-aquatic nature die, and others, more suited to the altered nature of the soil, take their place, and the atmosphere and sun's rays are permitted to penetrate with facility the space which the water had occupied. The necessary agents for promoting decomposition are then present, and the process first commences among the partially decomposed remains of vegetables which have perhaps died many years before, and it matters not whether their decomposition has been brought about by the action of Lime or the influence of draining. Seeds of difficult germination, existing in the soil, are placed under the same favorable circumstances as with Lime; for the oxygen absorbed by the seeds during the process converts the farinaceous matter which they contain into sugar, and the roots of the infant plant are supplied with it till it possesses strength to take hold of the soil, and to appropriate to itself a portion of the soluble matter which the process we have described had formed in the soil.

The Marquis of Tweeddale stated, at the Society's meeting at Berwick, that Lime seemed to be injurious to crops on land that had been drained. The noble Marquis did not state in what respect the crops were injured in consequence of the Lime; but it appeared to us not less evident than if his Lordship had stated it in explicit terms, that the injury could only have arisen from one of two causes, namely, from too violent action excited by the united influences of draining and liming a soil containing much decomposable matter; and the consequent evolution, too, of much gaseous matter, in its ascent to the surface, had loosened or *heaved* the soil, that the seed was thrown out or the plant rendered so loose as to become incapable of nourishing itself in the slightest drouth. This is one way in which Lime might prove injurious to drained land; but there is another we have frequently witnessed in the *lodging* of the crop before the ear is filled, from the luxuriance arising from excess of soluble matter excited by the united agencies of liming and draining.

We shall now mention some of the experiments which we made in the course of the season, which tend to illustrate and confirm the statements here advanced as to the causes of the appearance of white clover when Lime is applied. On the 12th May, 1841, we had a piece of land, well dug and cleaned, divided into nine parts, by means of pins driven into the ground, and division-boards nailed to them to keep them firm in their places. The use of the division boards was not only to divide the portions of ground separately, but also when the ground was leveled within them the exact depth of earth in each division might be measured.

No. 1. Six feet square; the clover seed sown on the surface.

No. 2. Ditto; the clover seed raked in gently.

No. 3. Ditto, half an inch of cover.

No. 4. Ditto; six-eighths of cover, one-half of the division compressed by treading, and afterwards smoothed.

No. 5. Ditto; one inch of cover, and the other half compressed.

No. 6. Ditto; one inch and a quarter of cover, the other half compressed and smoothed.

No. 7. Ditto; one inch and a half of cover, the other half compressed and smoothed.

No. 8. Ditto; two inches of cover, one half compressed and smoothed.

No. 9. Ditto; two inches and a half of cover, one half compressed and smoothed like the rest.

After the one half of the divisions, Nos. 4, 5, 6, 7, 8 and 9, were compressed by treading upon them, and smoothing them with the back of a spade, the one-half of each of the nine divisions in the opposite direction received an ordinary liming. The weather, for some time after the 12th, was mild, and sufficiently moist to forward germination. Nos. 1, 2 and 3, were in an active state of germination on the 19th day of the month; No. 4 on the 21st, and the compressed division not till the 25th; No. 5 on the 24th, and the compressed and limed division not till the 1st of June, the other sometime afterwards; No. 6 germinated only on the limed divisions; the uncompressed about the middle, and towards the end of June; No. 7 exhibited, at this time, no appearance of clover, and afterwards a few plants appeared on the limed divisions, some time after the removal of the weeds which had germinated upon it; and this operation, no doubt, promoted both the action of the Lime and the germination of the seeds, by allowing the air more ready access to those parts from which the roots had been extracted; and also, not improbably, by bringing some of the clover seeds nearer the surface. On Nos. 8 and 9 we had no clover plants in the course of the season. On Nos. 1, 2, 3 and 4, we could observe no difference on account of the Lime, though applied in a hot or caustic state; and the reason we conceive why it had no influence on these divisions was, because they were placed under circumstances so favorable to germination that it was effected before the action of the Lime commenced; and that on Nos. 5, 6 and 7, which were under circumstances less favorable, the germination did not take place till stimulated by the action of the Lime; and whether it will have any influence on Nos. 8 and 9, next summer will show.

The practical inference we would draw from these experiments, in the first place, is this—Is the present system of sowing clover calculated to promote germination? We have no hesitation in saying that it is precisely the reverse; for, when sown with rye-grass seed and harrowed in, in the usual way, it cannot fail to be too deeply covered, and the consequence of the rolling, which is now a general practice, must also increase the evil. It is, perhaps, from this cause that we always see the best braird of clover on the hard and gravelly parts of the field, and we therefore conclude that that is the land best suited for its growth, when, in fact, we are inclined to think that, under the present system of sowing, harrowing, and rolling, it is only the best adapted for the germination of the seed from its more permeable nature. It might be worthy of investigation to ascertain how far the present system of management will account for the falling off of the crops of red clover, which has been experienced for some years back; for

the germination of the seed of this plant requires circumstances not less favorable than that of the white. To ascertain this point, it would only require to be sown by itself, after the rye-grass is harrowed in, and might be tried either with or without rolling.

There is another practical application that may also be drawn from the view we have advanced regarding the action of Lime upon decomposable matter. We have imputed to this action nearly the whole benefit resulting to the crop from its application. If this view is well founded, it must follow that its application to land which naturally contains but little, or which has been exhausted of its decomposable matter by overcropping, or otherwise, (for much plowing, by exposing the soil to the action of the atmosphere, also tends to decompose animal or vegetable matter, and the crops to exhaust it,) can be attended with little or no advantage, and it is from this cause that the first application of lime is always attended with the best effect from the undiminished accumulation of this matter in the soil. The application of dung or any other manure to the soil, to use a familiar illustration, is like giving a feed of corn to a horse—it tends to strengthen and nourish; while Lime may be regarded as the application of the whip or spur—it imparts no new strength, but stimulates into action the power which previously existed.

[Trans. of the Highland and Agri. Soc. of Scotland.

THE HOUSEWIFE'S DEPARTMENT.

POULTRY, AND USEFUL RECIPES.

"To me more dear, congenial to my heart,
One native charm, than all the gloss of art;
Spontaneous joys, where Nature has its play,
The soul adopts, and owns their first-born sway;
Lightly they frolic o'er the vacant mind,
Unenvied, unmolested, unconfined."

It is said by naturalists, and by old women from whom naturalists and philosophers have learned much of all they know, that, hatch the egg of a wild turkey where you may, and rear the young as you may, neither art nor time can ever thoroughly extinguish its instinctive longing for the wood. To its shades and its privacy its inclinations ever point as the needle to the pole. Thus it is with the man who has been *reared in the country!*—he can never be cured of his predilection for scenes where first he set his traps, or chased the timid hare to his last forlorn hope of safety in the ground or hollow tree. His profession or business—the best use of his faculties for the support of his family—may impose a forced residence in a city. Sometimes it may happen that ample fortune may open the "world before him where to choose," and his heart may yearn for the open air and active exercises of rural life—yet the vanity, the caprice, the indolence and frivolity of an ambitious wife, may drag him to take up his abode in a large town, that she may the better enjoy its ease, its gayety, and all its luxurious and sensual indulgences. If, in this case, without training or necessity for business, he happen unfortunately to have no turn for literature, after sighing in vain for the physical excitements and occupations of the country, which might supply to him the place of books, he becomes wearied of existence, and so betakes himself to the dice-box or the bottle—ways ever open for escape from *ennui and from life.*

"But the long pomp, the midnight masquerade,
With all the freaks of wanton wealth arrayed
In these, ere triflers half their wish obtain,
The toiling pleasure sickens into pain;
And, e'en while Fashion's brightest arts decoy,
The heart, distrusting, asks if this be joy?

Thus it sometimes happens that a large fortune, which was the fruit of a long career of parental industry, and fondly designed as a blessing for the son, is turned into a curse by the folly of a wayward, ill-trained woman.

Not only with the country, but with the *women's department* in the country, are all a man's earliest and most grateful recollections associated! How, gentle reader, should it be otherwise? Was it not there that his heart first swelled with the spirit of rivalry and ambition, in plays at ball and bandy? that it first exulted in the pride of property, when mounted on his pet pony, Button or Taff, and *his own new* saddle and bridle? And, then, his gun and shot-bag, and home-made powder-horn, scraped into transparency with pieces of glass bottle! And, again, *who*, we pray you, carried the keys of the old closet under the stairs—that venerated repository of so many good *nugs:* sugar—molasses—preserves—ginger-cakes—almonds—raisins

—cheese? And who was it that skimmed, and skimmed lightly, on purpose to *leave* a skim of cream on the top of the *pan of bonnyclabber?* and sometimes slyly sugared o'er your buttered bread? Who let the urchin roast, without seeming to see it, in one corner of the kitchen fire, the egg stolen from some straggling nest found in the barn or under the bush? Who, when glorious *Saturday*—ever most beloved of schoolboys—came round, sewed the sheep-skin cover on his trap-ball, and gave him cotton to twist into a fishing-line, and twine to set and apple to bait his snare? And then, above all, who was it you relied on, of a doubtful "week-day" morning, when clouds were lowering in the north-west, to persuade the old gentleman that the children had better stay at home and "get their books" to-day—which you, and she, too, very well knew meant, virtually, to do anything else but that? Oh Woman! thy name is kindness, and in thine heart is the temple of charity! Lives there a man with heart not alive with remembrance of your good and tender offices?—

> "Oh bear him to some distant shore,
> Some solitary cell,
> Where none but savage monsters roar,
> Where Love ne'er deigns to dwell!"

But, back to our theme.

Sooner than we had promised or expected, we find ourselves under obligation to reöpen the Housewife's Department, for the sake of supplying some items immediately connected with what was given, under that head, in our last, and which are necessary to fill out what was there commenced—for, on review of it, we find it deals a little too much in the natural history of Poultry, and wears rather more the aspect of a literary article than one on *practical Housewifery*. So we return to it with a view to speak more in a common-sense way of *fowls*—their *food*, their *eggs*, and their *feathers*; and as Scripture saith the first shall be last, and the last first, we will begin with *feathers*.

Being a little rusty in our youthful reminiscences of Poultry management, we wrote—if we must tell the whole truth—to an old maiden sister, still left to us by a kind Providence, as the guide and the oracle, among her friends, in all that she pretends to know. She was nurtured in the strict principles of the old school, and would have practiced them from Nature, "any how"—direct, plain-spoken, and religious—one of those who, as the Scotch proverb says,

"Wears like a horse-shoe—the langer the brighter."

but she will be sure to scold us, if ever she catches us, for *putting her in the papers!*

From her we received the following, in answer to our inquiries, and which we transcribe nearly to the letter:

FEATHERS.—As I have experimented and found out a fact, that every housewife should know, and as I wish to be useful the little time I have to live, I should like it to be well known, that *feathers*, smelling ever so badly, may be restored to perfect freshness, by washing them clean [in soap suds] and letting them lie a day and a night in *lime water*, about as strong as we drink it, medicinally. They should then be dried as soon as possible in the air, or by a fire. It is not known what a quantity of dirt there is in very nice looking feathers. But it is not the dirt that makes them smell, so much as the *pen*, or *unripe* feathers. And here let us pause to ask if there be in nature any thing more beautiful—if it were not so common—than a barn-door fowl strutting in the splendor of his plumage, and the pride of his dominion, for which he is ever ready to battle with life? Every single feather, the eloquent Pailey observes, is a mechanical wonder. "Their disposition all inclined backward, the down about the stem, the overlapping of their tips, their different configuration in different parts, not to mention the variety of their colors, constitute a vestment for the body so beautiful and so appropriate to the life which the animal is to lead, as that I think we should have had no conception of any thing equally perfect, if we had never seen it, or can now imagine anything more so." For the curiosity and observation of those to whom this department is dedicated, we give some of the laws which according to naturalists *regulate the varieties and changes of plumage*. To us some of them are new, and the observation of them may well form a part of that variety of study and amusement, which is to be found, for an active mind in every walk of rural life. That eminent patriot and farmer, the late "Col. JOHN TAYLOR of Caroline," Va., took great pleasure in feeding his pigeons and his Poultry with as much regularity as he took his own meals.

ZOOLOGY, as every one knows, is the science of animals. That is, it teaches their nature and properties, their classification and their order of succession upon, and their distribution over the earth. In Zoology what relates to the *plumage of birds*, is called *Indumentum*, from the Latin word, *Induo*, I put on—and the laws of plumage are, that it is generally more than once changed, before it attains that state which is characteristic of the fully mature bird. The period during which these mutations are proceeding, varies from one to five years, and many birds rear a progeny before they acquire the plumage of maturity. When the *indumentum* of the male bird differs in color from that of the female, the young birds of both sexes resemble the latter in their first plumage. But when both the adult male and female are of the same color, the young have then a plumage peculiar to themselves. In some species the adult birds have

a plumage during the breeding season, decidedly different in color, from that which they bear in winter; in these cases the young birds differ in color from both parents, and have a plumage which is intermediate in its general tone, to that of the two periodical states of the parent birds, and bearing indications of the colors, to be afterwards attained at either period.

The changes in the color of the plumage of birds are effected either by a total moult of the old and acquisition of new feathers, or by a partial moult and the admixture of new feathers with a certain portion of the previous plumage; or on the birds obtaining a certain number of new feathers, without shedding any of the old ones; or, lastly, by the fully formed feather itself becoming altered in color: the last two changes take place in the adult birds at the approach of the breeding season. The change of color of a fully developed feather is produced, either mechanically, by the wearing away of the lighter colored tips, which exposes the brighter colors of the plumage beneath, or by some internal chemical or vital influence upon the coloring matter of the feather itself. The latter change begins at that part of the web nearest the body of the bird, and gradually extends outward till it pervades the whole feather.

So much for *feathers*. We return to the letter from our good old sister. What she says is always in a plain, common-sense way, and for every-day use. *The raising of Poultry*, she adds, is no trouble, compared to keeping them from *rats*, particularly where there is an *Ice-House*. There was never but one rat seen here, until we got an ice-house; now they devour chickens on one side of the house, while on the other we are ruined by *minks*—and *hawks* all over the plantation! There are so many ways to treat Poultry that it is impossible to know, exactly, the best.

J. H. W. keeps the old hens up (in coops) from the time the chickens are hatched until they are fit to eat; and a most excellent way it is, but I think it too great a punishment. If I had my choice, I would raise ducks, both sorts, and chickens, with old turkey hens. True, they take them away from the house, but then they travel so slow, so gentle, that it suits much better.

Food.—For young chickens nothing is better than *Indian corn dough*, until they can eat corn or the refuse of wheat. They will eat the latter in a few days, and small-grain corn in less than three weeks. The sooner they get to eat grain the better.

Muscovy and Puddle Ducks.—These differ very much in their habits, but will do to *feed together*. Both should always have access to water, particularly in very hot weather. They require a place where they can *cool their feet*. I prefer a pond, if running water is not convenient. I have seen their feet parched with the heat of the ground.

Food for Ducks.—Wet meal or wheat bran for a week or two, kept in a coop or place that they can go to at pleasure. After some time, a *rich wash*, made of any kind of vegetables—nothing better than *parsley*, thickened with the husks of Indian meal. It will not do to keep both sorts of ducks for breeding on the same dung-hill.

Turkeys.—These should not be disturbed by any means, *while they are hatching;* and if they could be set to hatch so far apart as not to hear each other's young, it would be better. Some people have the nests so fixed that the old ones can't leave them while they are hatching.

Food for Turkeys.—The first thing is a *grain of pepper* to each—see that they swallow it; then corn-meal wet. After a few days, a spoonfull of *tobacco seed* put in victuals for thirty turkeys for the day. This may be done every day, if convenient, and now and then about a *tea-spoonfull of copperas*, say three times a week, in the evening. One great point is to keep them clear of *lice* (you may call them what you will!) The only thing to do that is *soft grease*, in dry weather; but there should be great care used so as not to make them too greasy. Lately a more certain remedy has been found: it is *fishberry*, steeped in whisky, sold by the apothecaries. But after being raised, there is a most fatal disease for turkeys, which attends them soon after going into the *tobacco fields*. They are taken with a *choking;* seem to draw their necks down, as it were, into their craws, and then discharge from their mouths the greatest quantity of matter of the most shocking odor. Out of forty, large enough to eat, we saved but seven. We think that was done by giving them lard—a piece as large as a nutmeg. When first taken twice will be enough to give it.

Now I think you must want something to put in your paper if you put in it this nonsense, with the exception of the *cure for bed-feathers*.

Now, verily, good sister, we think very differently, and so we opine, will our readers. But that which relates to the disease which befals the turkey after being turned into the tobacco field, requires a note of explanation for housewives who do not abide in the region of that precious weed! Be it known, then, that where tobacco is grown, turkeys are raised, or if not raised, bought, for the express purpose of being driven through the day, except in the very hottest part of it, through the tobacco fields, *to destroy the worms* that infest, and sometimes make dreadful ravages on the crop. You will see the old turkeys, attended by the young gang, take each its row, and go marching quietly

along, as if stepping to the tune of the dead march in Saul, examining each plant critically as they proceed, and devouring the smallest speck of a worm. But for these armies of turkeys, so employed, the crop of tobacco in Maryland would be very materially shortened every year.

In that State, planters whose wives are not smart enough to have the requisite number raised, or who, as most frequently happens, are denied *the necessary houses and fixtures and help to do it*, buy from poor people—often from poor widows—giving, though with very unbecoming hesitation and reluctance, as much as 50 cents each, when they are as large as partridges (which in New-York they call quail, calling *pheasants* partridges), at which time they are considered past the "vicissitudes of youth," and *out of danger*.

When the tobacco crop is housed, the turkey has performed the good office for which he was chiefly reared or bought; and having saved by his services three times what the poor widow got for it, the planter sends the surplus of the gang to Washington to be sold, generally, for double what he so reluctantly gave, most generally to another poor widow, keeper of a boarding-house to be devoured by Members of Congress, some of whom are mean enough again to jew down this poor widow to the last farthing, that he may clear his $7 out of $8 *per diem*.

But something yet remains—

Eggs.—Without Poultry how are we to have eggs—and without eggs, how are we to have Poultry! The two things go together, and will, we may hope, remain mutually dependent on each other, notwithstanding the power of a thing called an *Eccaleobian*, by which *incubation* is performed without the aid of the hen.—There is in fact, no knowing what steam will not do sooner or later; so far, however, it has left every hen to lay her own eggs. The number of eggs imported into England in 1839, was 83,745,723, and the amount of the revenue derived from them to the Government, was $150,000.*

The specific gravity of new laid eggs, at the first, rather exceeds that of water, varying from 1080 to 1090; but they soon become lighter, and swim on water, in consequence of evaporation through the pores of the shell.

"When an egg is boiled in water, and suffered to cool in the air, it loses about 32 hundredths of a grain of saline matter, together with a trace of animal matter and free alkali. The mean weight of a hen's egg is about 875 grains, of which the shell and its inner membrane weigh 93.7 grains, the *albumen* or white 529.8 grs., and the yolk 251.8 grs. The shell contains about 2 *per cent.* of animal matter and 1 *per cent.* of the phosphates of lime and magnesia, the remainder being carbonate of lime with a trace of carbonate of magnesia. When the yolk of a hard boiled egg is digested in repeated portions of strong alcohol, there remains a white residue having the leading characters of albumen, but containing phosphorus in some peculiar state of combination; the alcoholic solution is yellow, and deposits a crystalline fatty matter, and when distilled leaves a yellow oil. The albumen of the egg contains sulphur. The use of the phosphorus is to yield phosphoric acid to form the bones of the chick: but the source of the lime with which it is combined is not apparent, for it has not been detected in the soft parts of the egg, and hitherto no vascular communication has been discovered between the chick and the shell." [Brande's Encyclopedia.

We shall conclude this discourse with the following directions, which we consider the best, for *cooking* eggs, in several of the most palatable forms in which they can be prepared for the table. Man may say, in the pride of his wisdom, that any fool can poach an egg, or cook an omelette. Very well then; *let him try it!*

MISCELLANEOUS PREPARATIONS.

To Boil Eggs.—The boiling of eggs is a very simple operation, but is frequently ill performed. The following is the best mode:—Put the egg into a pan of hot water, just off the boil. When you put in the egg, lift the pan from the fire and hold it in your hand for an instant or two. This will allow the air to escape from the shell, and so the egg will not be cracked in boiling. Set the pan on the fire again, and boil for three minutes or more, if the egg be quite fresh, or two minutes and a half, if the egg has been kept any time.

To Poach Eggs.—Take a shallow saucepan or frying-pan, and fill it about half full of water. Let the water be perfectly clean, not a particle of dust or dirt upon it. Put some salt into the water. Break each egg into a separate tea-cup, and slip it gently from the cup into the water.—There is a knack in doing this, without causing the egg to spread or become ragged. A good way consists in allowing a little water to enter the cup and get below the egg, which sets the egg to a certain extent, before it is allowed to lie freely in the water. If the water be about boiling point, one minute is sufficient to dress the egg; but the eye is the best guide: the yolk must retain its liquid state, lying in the centre of the white. Have buttered toasted bread prepared on a dish, and cut in pieces rather larger than the egg; then take up the eggs carefully with a small slice, pare off any ragged parts from the edges, and lay them on the bread.—They may be laid on slices of fried bacon, when preferred.

Buttered Eggs.—Put a piece of butter in a saucepan, and melt it, adding a little milk.—Break the eggs into a basin, and pour them into the saucepan. Season with salt and pepper, and continue stirring the eggs till they are sufficiently dressed. Serve on pieces of toasted bread.

Omelettes.—Omelettes are composed of eggs and any thing that the fancy may direct to flavor and enrich them. For a common omelette,

* For the wonderful estimated value of the Poultry raised in the United States and in each State, see last number of the Monthly Journal, page 275—aggregate $9,344,410. New-York, $1,153,413; Michigan, $82,730; Tennessee, the *crack corn* State, upwards of $600,000, &c. &c.

take six eggs, and beat them well with a fork in a basin; add a little salt. Next, take a little finely chopped parsley, finely chopped eschalot or onion, and two ounces of butter cut into small pieces, and mix all this with the egg.—Set a frying-pan on the fire with a piece of butter in it; as soon as the butter is melted, pour in the omelette, and continue to stir it till it assume the appearance of a firm cake. When dressed on one side, turn it carefully, and dress it on the other. It will be dressed sufficiently when it is lightly browned. Serve it on a dish. The flavor may be varied, by leaving out the parsely and onion, and putting in finely chopped tongue or ham, oysters, shrimps, grated cheese, or other ingredients.

PANCAKES.—Pancakes are made of eggs, flour, and milk, in the proportion of a table-spoonfull of flour to each egg. To make two small pancakes, take two eggs, and beat them well, and add to them a little milk. Then take two table-spoonfuls of flour, and work it into a batter with the egg and milk; add a little salt. Set a clean frying-pan on the fire, and put a piece of butter or lard into it. When the butter is quite hot, pour in the batter. Shake it frequently, to prevent it from sticking. When the under side is of a light brown, turn it. Serve the pancakes folded, with sugar strewed between the folds.—This is the way of dressing the common pancake; when required to be lighter, use more egg and less flour; and grated nutmeg may be added.

FRITTERS.—Make a batter of eggs, flour, and milk, as for pancakes, but with a little more flour. Apple fritters are made by cutting large pared apples in slices, dipping the slices in the batter, and frying them separately. They are done when slightly browned on both sides.—Another, and perhaps more common way, is to cut the apples in small pieces, and mix them with the batter, frying them, a spoonful in each fritter. Fritters may be made with currants in the same manner. Serve all fritters with sugar sprinkled over them.

[Chambers' Information for the People.

Should any gentleman object to the appropriation of a small portion of the 100 pages a month, which this journal contains, to the use and amusement of *Housewives*, he will please do so under his name, and state whether he is a married man. But why should even the *bachelor*, pushed from one place to another, and thrown about as if he were but the one-half of a pair of scissors, useless to all ends, except to drive out the dogs, keep the doors shut in winter, and pull the bell all the year round; why should *he* object to an occasional discourse for the benefit of the fairer and kinder part of creation. Let him fall sick and be thrown off his feed, and see who is his *best doctor!* Who will send and have his sheets aired and his bed warmed, and provide him a clean night-cap, and his saucepan of panada or chicken-water, and nurse him as if he were of consequence in the world; is it not the *Housewife?*

Be it known then, until some gentleman enters his caveat, under his proper name, we shall appropriate a portion of the Monthly Journal occasionally to *Housewifery*, and shall treat of a few things that may be mentioned in advance, as they occur, as for example—Precautions as to fire; clothes catching fire; burns, scalds, cuts; poison; every thing about a house and its furniture, such as earthen ware and china, tables and chairs; baths and foot warmers; servants and cleaning; oil-cloths; walls of rooms, paper-hangings; kitchen vessels, dish covers; knives, lamps, lamp glasses; furniture; varnishing; bottles; flannel and woolen articles; silks; clear starching; smoky chimneys; salting and smoking meat; preserving flowers fresh; destroying vermin, rats, mice, bugs, fleas, lice, flies, moths, slugs, and a hundred other things, too tedious to mention. Then we will take up the toilet, and treat of preserving the teeth, the nails; will tell them how to make pomatum, cold cream, spermaceti ointment, and cosmetics of all sorts. In due time they shall have the best recipes for every thing that belongs to the dairy, the garden and the flower bed. Not such as are to be found in "5,000 recipes," made, like Pindar razors, *for sale*, but *founded on experience, and recommended for their common use, economy, and practical excellence.* What, dear, good, lady Housewives, will we not essay for your benefit!

THE GOOD HUSWIFELY PHYSIC.*

BY THOMAS TUSSER, GENT.

GOOD huswives provide, ere an' sickness do come,
Of sundry good things in her house to have some:
Good *aqua composita*, and vinegar tart,
Rose-water, and treacle, to comfort the *(c)* heart.
Cold herbs in her garden, for agues that burn,
That over strong heat to good temper may turn;
White endive and succory, with spinage enough—
All such, with good pot herbs, should follow the [plough.
Get water of fumitory, liver to cool.
And others the like, or else go *(b c)* like a fool;
Conserves of barberry, quinces, and such,
With sirops, that easeth the sickly so much.

Ask *Medicus* counsel, ere med'cine ye make,
And honour that man for necessity's sake.
Though thousands hate physic, because of the cost,
Yet thousands it helpeth, that else should be lost.
Good broth and good keeping do much, now and than,
Good diet with wisdom, best comforteth man.
In health, to be stirring shall profit thee best;
In sickness, hate trouble, seek quiet and rest.
Remember thy soul; let no fancy prevail;
Make ready to God-ward; let faith never quail.
The sooner thyself thou submittest to God,
The sooner He ceaseth to scourge with his rod.

VARIATIONS.—*(c)* thine. *(b c)* lie.

* Though powerful medicines should never be administered, except by professional men, certain simple remedies ought to be kept in every family; not, indeed, such as are here enumerated, but such as improved medical knowledge has shown to be equally safe and efficacious. The list, however, is curious as an evidence of the state of domestic medicine in the sixteenth century; and the advice which follows proves the good sense and piety of the writer, which, indeed, are universally conspicuous in his works.

[Doctor Rush's opinion being once asked, what per cent. had been added to human life by the art of medical practitioners, answered, that it depended upon whether old women were to be included in the list—because if not, the addition would be much less.] [*Ed. Farm. Lib.*

THOUGHTS ON THE DISTRIBUTION OF LABOR;

SUGGESTIONS FOR THE FORMATION OF INDUSTRIAL SOCIETIES FOR SPECIAL OBJECTS.

WHAT has most contributed to the progress of improvement in manufactures, is the *distribution of labor* which they admit of. The mind of the operative being confined to a single point, he attains greater proficiency, and can accomplish much more than if he were taken frequently from one part of the manufacture to work at another. In this case, he gets his "hand out," as it is termed; and hence a smith who might make a horse shoe at a heat, as we have known a man to do, might yet not make half as many nails in a day as a boy whose business had been nothing but nail-making all his life. A man who only makes nails occasionally, will make but 800 or 1,000 a day; while a boy who has never worked at any thing else, will make 2,300. Even in pin making, labor is so distributed, that the man who makes the pin, never fashions the head or sharpens the point.

Agriculture would doubtless have attained much higher perfection in all its processes, if it would admit of the same distribution of labor that may be resorted to in other manufactures; and house and ship building. The process of sowing, plowing, hoeing, reaping, would all be more perfectly executed, if those who perform them, could find constant employment at, and be exclusively confined to each one of these operations. But the farm laborer, and especially the Yankee farmer, has to exercise his ingenuity on every thing that is going on, in its turn, and so becomes Jack-of-all-trades, without being as perfect at any, as if he were to attempt but one. In Europe, the case is somewhat different. In France, for instance, *mole catching is a trade;* transmitted from father to son, and men have made independent estates by extraordinary expertness in the practice of it. In Spain, a *shepherd* is nothing but a shepherd; the calling "runs in the family;" and thus a shepherd's son, by the time he is 18 years old, learns more of the diseases, habits, breeds, and management of sheep, than a common laboring hand would in 40 years, who attends a little to sheep, and a little to every thing else. A practiced shepherd would shear more sheep in a day, than a raw hand who might possess more intelligence and physical activity, could shear in three, and in the operation, draw less blood from the flock, than he would from a single sheep.

Seeing how it is that "practice makes perfect," this principle of the distribution of labor, we find is acted upon practically, where it can be done; and if it could be carried through in every operation into which agricultural industry divides itself, as we before said, greater improvements would have been realized. As it is, on every large plantation for example, you will find that Abraham may be the blacksmith and the butcher, Jacob the miller, his son Hanover the distiller and flax breaker, Tom Peel the head carter, and Cyrus the foreman in the field; go to an old family estate like Brandon on the James river, and you will find an old man, gardener, *practically* skilled in the physiology of vegetables and flowers, while another venerable and grey bearded ichthyologist, most knowing in all the signs of the tides and the weather, has charge of the boats and the lines, and the nets, and will be sure to have, in time for dinner, a good mess of fish, or crabs, or oysters, when any raw pretender would have the worst of "fisherman's luck;" and every one knows what that is.

If it were possible, for instance, that the labor involved in making tobacco, could be so distributed, that raising and selling the plants, cultivating and selling the green crop, curing it, culling and tieing up, and finally seasoning and preparing it for the manufacturer or the shipper, could have a separate set of operatives, exclusively assigned to each link in the chain, and these operatives each find constant employment on his particular branch, the whole business of tobacco husbandry might no doubt be carried on with much greater perfection and success, and the annual value of the crop, and the interest on the capital and labor embarked in it would be proportionably enhanced.

In mechanics, the making of a knife is apportioned out among several persons; the making of the blade, the handle and the rivets, become, as it were, so many separate trades, and thus the same number of men will make a much greater number, and of course their labor, which is *their* capital, becomes so much the more productive; and it is this distribution and greater productiveness of labor, very much enhanced by more perfect tools, that make the great difference in the condition of the savage and the civilized man. Compare the rude implements of the savage, with the saw, the auger, and the hammer, and you at once see the cause of the difference between his bark hut and the monarch's

palace—between his bark canoe and the magnificent steamboat—between his war club and Colt's revolving pistol. The story of the tools named, their invention and uses, would be the history of civilization itself. It would trace the progress of the arts, from the use of the gourd to the manufacture of the celebrated "Portland's mystic urn." In every trade, as you distribute duties, you fix responsibility and promote skill. But having indulged in these reflections, let us apply them where they can be applied, and it is at this we have been aiming. Let the principle be kept in mind in the *formation of societies for agricultural improvement!*

Our Agricultural Societies are too anomalous, too heterogenous. They undertake too many things at once—the result is that much is attempted, but little is done well. Look at the vast variety of objects comprehended in the bills of those *annual* exhibitions—not an animal, nor a machine, nor a fowl, nor a grain, nor grass, nor vegetable, nor fruit, that a single Society, coming together once a year, for two days, does not undertake to improve. The result is, that while some are improved a little, others are not at all, and the aggregate melioration from year to year, is *scarcely perceptible.* Would it not be better to form out of the same members, different societies for *special objects?* For example, the IMPROVEMENT OF HORSES, or of AGRICULTURAL MACHINERY. These are important branches of rural economy, and each a study in itself—and the first inquiry should, in all cases, be, not what premiums should be given for particular objects, but whether the *object deserves encouragement at all.* Premiums have been offered in Maryland, for more than twenty years, for heaviest crops of beets and turnips and carrots and potatoes. Well, let us ask, not whether the quantity per acre, has been going on increasing from year to year, as the result of greater skill elicited by these premiums, *but* has the aggregate culture itself *extended a single acre in that time;* and if not, is it not a broad hint that you should pause to inquire whether there be not some strong reasons, in the circumstances of the country or locality, some defect in soil, some uncongeniality of climate, some *un*economical result of labor; in a word, some powerful considerations in the nature of the case, that forbid the extension of root culture. Indications which admonish you that you are working against the natural policy and interests of those you represent. That your bark, pushed against wind and tide, is making lee way! would it not be better to direct your zeal—so well meant, so patriotic, so admirable in itself—to some *new objects?* For one, among others that might be named, would it not be advisable to offer a high premium for the earliest and most successful experiments which shall illustrate the expediency—or not—of adding *Madder to the crops now cultivated.* Those who use it in dyeing, think the farmer might raise it with a good profit, at one-third of its present price. We shall in due time, tell all we can learn about its nature, cultivation, uses, &c. We only mention that one thing, because it comes uppermost, as the pen glides along. Another object may be suggested as well worthy of diligent inquiry, by a special society, who should give it earnest and exclusive attention. That is, an inquiry into the practicability of applying *steam power* to a variety of *agricultural purposes,* to which it has not yet been extended in this country? If the simpler and less efficient contrivances for giving greater productiveness to man power, have been the cause of multiplying the human race, and of augmenting their comforts and enjoyments; if, in fact, these may be considered as proportioned to the number and perfection of artificial labor-saving inventions, why not apply the productive powers of steam to Agriculture, as well as to mechanics, manufactures, navigation and war? Who that reflects on the advantage which steam power affords in its greater rapidity and certainty, does not see what an advantage might have been taken of its use in the late rise in the price of grain, by getting it ready for market in less than half the usual time. It is estimated in England, that a six horse steam power will thresh and clean nearly four hundred of our bushels a day. For fuel, "culm or dross" is generally used, and unlike horse power, when not working, it *costs nothing.* Is there any good reason, we repeat, why steam power should not be made to do for Agriculture, what it has done for manufactures and the arts? Is not the enjoyment of this great, this invaluable productive power, applied with such effect, in the industrial operations of other classes, the reason why they so much outstrip the tillers of the soil, and with less capital, go ahead of them in population and wealth. In our next, we shall give a more extended view of this subject—suffice it now to prompt the farther consideration and inquiries of American Agriculturists to quote a writer, who says, "so rapid has been the extension of steam power *to farms* in this vicinity, that from the fine elevations round Edinburgh, more than 100 steam engine stalks or chimneys, may be observed as land-marks of the farms, and giving a peculiar feature to the landscape."

We have been told that Mr. Bolling, to his honor, has had the enterprise to put up a steam machine on his farm in Virginia, and finds it exceedingly satisfactory, convenient and profitable; and we doubt not his example will be followed—but then *how slowly,* compared with what it would be, were the subject investigated and illustrated, as it might be by an *active, spir-*

ited, intelligent association of patriotic individuals!—with the pages of the Farmers' Library at command, ready to have all their drawings and diagrams gratuitously engraved and distributed? These are among the glorious results we anticipate when landholders take upon themselves the duties of legislation and control of public money levied on themselves directly, or indirectly which is worse, and lavished on objects alien to their pursuits and at war with their best interests.

But our chief object at this time was to show, what have been the fruits in a single case, of the establishment of a society for a *single object in another country*. Why not establish a similar society in *our* Hemp and Flax region?—But to the case in view—we commend what is here set forth especially to the cultivators of Hemp and Flax in *Virginia, Ohio, Missouri, Kentucky, Indiana, North Carolina*, and others engaged in this branch of industry, the States mentioned being the largest producers, if *any* confidence is to be placed in the Census. The best reference we can make for quantities produced by each is to the Tables in our last, from "*Tucker's Progress of the United States.*"

In towns, for promoting improvement in the arts, there is the less necessity for such separate and especial associations, for there the whole community may be considered a club within itself. They are in constant daily communication of thought, and in the way of observing every new discovery. They work, as it were, under the eyes of each other, and the constant interchange of information produces an aggregate of knowledge, and all imaginable acceleration in the career of improvement and efficiency. The very condition and circumstances of existence of those who make up dense communities, supply the necessity and the place of organized associations, so useful to isolated farmers, if they would keep within sight or hearing of those who are marching on other lines of industrial pursuits.

In Ireland, then, there exists, as it appears, and has done for some years, a "SOCIETY FOR THE PROMOTION AND IMPROVEMENT OF THE GROWTH OF FLAX." Among other proceedings, to throw light on the culture and management of flax, this society published a small tract, comprising the best information to be had at home and abroad on that particular subject. It is well known that the value of the crop depends mainly on the care taken in the *preparation of the fibre*, the value which that may be made to assume when it has undergone the finishing process of the finest manufacture, and the amount of employment which the produce of only three acres may afford are well illustrated by the following exposition by Doctor KANE.

A Mr. William Blakely, he says, grew last year near Warringstown, Ireland, three statute acres (1 a. 3 r. 16 p. Irish measure) of Flax, which he managed strictly according to the directions put *forth by the Society*. The produce of the field was purchased for 15 shillings, say $3,75 per stone of 16 pounds, by the eminent manufacturers of cambric, Messrs. McMurray and Henderson, who pronounced it equal, if not superior, to any Flax they had ever seen, and that they had given for foreign Flax of inferior quality thirty six shillings per stone.

The entire produce of the three acres was estimated at 120 stones, which at 15 shillings, would give the farmer £90 or $450; but as a part of the Flax had not been gathered, and might possibly fall below the estimate, Doctor Kane puts down the crop, with *certainty* at 100 stones, which will realize £75, or $375.

This Flax, when Doctor Kane wrote, was in process of conversion into *cambric pocket* HANDKERCHIEFS, and was capable of being spun into thirty hanks to the pound, and was to be spun by hand. Mark now, says he, the employment this will give.

"It will give constant employment for twelve months to 158 women to spin it; 18 weavers will be occupied a like time in weaving, and it will employ forty women for a year to hemstitch (or vein) the handkerchiefs, thus giving constant employment, for twelve months, to 210 persons.

"It is curious to trace the result of the process which this flax is now undergoing. It will produce 210 webs of cambric, each web containing five dozen handkerchiefs, each dozen will be worth 50 shillings, and the entire produce of the three acres of flax when carried through the entire process of manufacture will be worth £2,600 or $13,000, or upwards of $4000 per acre for the manufactured produce. What an illustration is here, of the dependence of the world upon *Agriculture!*—and yet how little of the world's legislation is really directed *by and for the landed interest!* The calculation is, as will be seen in a subsequent chapter, that the labor necessary for these three acres, would be seven days for three men, fifty-four days for three women, and four and a quarter days for a horse.

It has been seen to how many people, proportionably, the product of the labor of a few tillers of the soil gives employment and support; who, in their turn, make demands on the surplus products of the agriculturist, demonstrating the harmonious dependence of these classes on each other, a harmony and mutuality of support that should be left in their natural relations, and that ignorance or wickedness only would seek to disturb or impair.

The quantity of flax grown in Ireland appears to be on the increase, and its quality to be improving, as, in the Report of the "*Flax So-*

ciety," it is stated that the amount of the crop in 1841 was 25,000 tons, averaging £45 or $225 per ton, whilst in 1843 it was 36,465 tons, and the average value from improved quality considered to be £55 or $275! This increase of value $573,250 being, if not wholly, certainly in great part *attributable to the exertions of that very useful society!!*

Why not form such societies in the hemp and flax districts of the United States? We have no conception until it is systematically undertaken, how much light may be concentrated on every industrial pursuit. We respectfully offer our "FARMERS' LIBRARY AND MONTHLY JOURNAL OF AGRICULTURE" as a medium for collecting and a repository for storing away all such information for the common benefit, and we earnestly suggest that Editors of Western and South-Western papers, including those of Virginia and North Carolina, should disseminate the articles here given on the subject of flax and hemp, branches of industry susceptible of being much and profitably extended in our country.

JERUSALEM ARTICHOKE .... (*Helianthus tuberosus.*)

LET any important discovery be made that may be beneficial to the manufacturer, the mechanic, or the mariner, its application is immediate, and it at once comes into general use; not so with the farmer. Let the new product be ever so valuable, the new process ever so cheap, he is slow to adopt the one, or to practice the other. Witness that most precious gift of the new world to the old, the Potato (*Solanum tuberosum.*) It required an hundred years from its introduction by Sir Walter Raleigh, to bring it into general use; and thus it is with the clover, thus with lucerne, thus with plaster, thus with lime, and thus with many of our most valuable agricultural implements. But let us hope that the day of regeneration for the farmer is at hand; that he will shake off the lethargy that has so long held him enthralled, and take at once the foremost place in the great race of human improvement

These reflections are suggested to the writer by the almost universal neglect of that most valuable tuber the Jerusalem artichoke, (*Helianthus tuberosus*) a plant that (should the rot in the potato not be checked) is destined to take the first rank among roots subjected to field culture. Although a native of the warmer parts of this continent, it is one of the hardiest of all cultivated plants, deriving, as it does, through its large leaves, most of its sustenance from the air, it is a great improver, it is wonderfully productive, and thrives in the poorest soils. Eagerly sought by horses, cattle, sheep and swine; it furnishes an aliment as nutritious and healthy as it is cheap. Yvard, the distinguished professor of rural economy at Alfort, whose contributions to agricultural science are so valuable, recommended its cultivation both by precept and example. Arthur Young affirms the net profit of its cultivation to be much greater, beyond all doubt, than that of any other ordinary agricultural production; and finally it remains in full production on the same spot for ten years or more. The writer will here state what he knows of its cultivation, having witnessed it on a large scale in France on the estate of George Lafayette, brother-in-law to the Count de Tracy.

As opportunity offers through the winter, the ground is flushed up as deeply as possible with the ordinary two horse plow; in the spring, cross plowed and as thoroughly pulverized as possible; the land is then laid off with the double mould-board plow in furrows two feet apart, women and children follow the plow, dropping the *whole* tubers from eight inches to one foot apart as nearly as may be, another plow follows to cover them up; when the plants are well up the harrow is run over the field lengthway the furrows, and finally, one working with the shovel-plow or cultivator, when the plants are eighteen inches high, and the crop is made.

The roots are suffered to remain in the ground to be thrown out with the plow as wanted through the winter, or hogs are turned in upon them.

By an accurate chemical analysis, the artichoke is found to contain *one-third* more nutriment than the beet; it is as much relished by horses as the carrot, is more nutritious and of course much less expensive; it yields a fair profit on soils too poor for the potato, the beet or the carrot; few plants suffer as little from drouth; it withstands the most intense cold, it is never attacked by insects or disease, and may remain in the ground with perfect safety until used. Waste land stocked with the artichoke and apple trees would make the finest range imaginable for swine. F. G. S.

CELLARS, *versus* SPRING HOUSES FOR DAIRIES.

THE following is taken from the OHIO CULTIVATOR, which we may presume forms a part of the reading of every farmer, at least in that populous State, a State of which it is needless to say any thing, except to note the naked fact, that from a population in 1790 of 45,365 (half the number of the State of Delaware,) she has gone up in fifty years, (1840) to 1,519,467, solid, substantial, working men and women, boys and girls.

If it would not savor of presumption to speak more particularly of a work so much better known than this is, we would add, as to the CULTIVATOR, that it is edited with much zeal and ability —its whereabouts is Columbus, and the price $1—published 1st and 15th of every month.

The number for 15th Nov. thus corroborates, on editorial experience, what has been asserted in other papers, and is well worthy of attention on such authority; by-the-bye, our brother Editor of the Cultivator ought to be a happy man, considering that he is—a *Bachelor!* We see him on all occasions associated with young ladies in charge of the *Floral Departments* at the Agricultural Exhibitions—a department which is sure to attract and be surrounded by the *fairest* of the *Fair*—and now, we have his own confession, that he has been "prying into the mysteries of quite a number of good dairy maid's milk-houses!" If such are *Bachelor's privileges*, we shall cease to wonder that Benedict is *not* a married man!

We are inclined to believe, however, that the kind of house he proposes to make will not fully answer his expectations. In our rambles among the farmers for a number of years past, we have pryed into the mysteries of quite a number of good dairy women's milk houses, and the result has been a conviction that the introduction of running or standing *water* into the milk house *is more injury than benefit.* We are aware that this is contrary to the opinions of the majority of housewives. They think a good *spring house* is almost indispensable for producing good butter in summer; and yet we have never found on the tables of those who possess this much envied advantage, as good butter as where a well constructed cellar is used for the milk room. The reason is, the *dampness* occasioned by the water, is more injurious to the milk and butter than is compensated by the coolness it occasions. It is found that a *dry*, as well as *cool*, atmosphere is needed for this purpose; and it is better to dispense with some of the coolness than *all* of the dryness.

Our advice to 'A SUBSCRIBER' would therefore be, abandon entirely the idea of bringing water from a well, a cistern or an ice house, and construct a good dry cellar on your northern exposure, with thick walls of brick or stone, to preserve an even temperature; a *stone* or cement floor, well drained below; and windows on each side to afford ventilation. Plaster the ceiling, and avoid as much as possible the use of wood in all the structure. It is needless to add that nothing but milk and butter, and the vessels or implements used therewith, should be admitted into the milk room. Any article or substance that is liable to contract mould, or cause the least smell, will affect more or less injuriously the flavor of the milk and butter. Hence, too, the indispensable necessity of *perfect* CLEANLINESS—the great CARDINAL VIRTUE of all good dairy management. (The water that flows from an ice house in summer, has always a musty smell, that would ruin the milk and butter in a dairy.)

We shall have more to say on this subject at some other time, and shall be happy to have our correspondents express their opinions, or give us the results of their experience in relation to it. In addition to what has been said, the following excellent article, from the (Philadelphia) Farmers' Cabinet, will suffice for the present:

"THE MILK CELLAR.—It is a curious fact, but by no means unaccountable, that in many parts of the country the milk *cellar* is superceding the *spring house*,—an appendage that has always been considered indispensible for the production of good butter, be the other qualifications of a farm and its appurtenances what they might. While on a visit to Wilmington, Delaware, I had occasion to remark the excellence of the butter at my friend's table, when he replied, he always selected the best cellar butter at market, for the use of his family, giving it as his firm conviction, that butter made in a cellar, was far preferable to that made in a spring house, its great recommendation being, in keeping sweet and good much longer, and retaining its fine flavor and color to the last, which spring house butter would not do. And he observed, it is customary to account for the greater price which some dairymen obtain for their butter in the market, by saying it is *cellar butter.*

Of course, it is readily admitted that much depends on the mode that is adopted in the management of the dairy, commencing with the breed and feed of the cows, and ending with the manipulations of the butter; but the idea is gaining ground, that the best butter is to be made in a cellar, all other circumstances being equal

On reconnoitering amongst my friends, I found that several of them had substituted the cellar for the spring house; and I do not know one who is not satisfied with the arrangement, except it be where the cellar is dug in a damp soil, or has been most injudiciously opened to the well, the evaporation from which fills the room with constant moisture, which may be found adhering to the walls, the ceiling and the wood-work, the shelves, and particularly the inside of the door, causing a damp and clammy feel, and a nauseous, mouldy smell, which the butter imbibes, to its lasting injury; indeed no good butter can be made in such places.

But another revolution is taking place even

amongst the advocates for the cellar; it is no longer thought necessary to dig the cellar very deep, or to arch it over with stone or brick, with an air passage through it for ventilation—a *vault* as it is more properly then termed: it is found sufficient, if the cellar be sunk a few feet below the surface of the earth, with a wide and shallow window on each side, the bottom of it level with the ground outside: well protected with a wire guard to keep out vermin, large flies, &c., and provided with a close glazed sash, which can be opened and closed at pleasure, by lifting it up to the *ceiling*, which ought to be no higher than the top of the windows; so that the air of the cellar can be ventilated by opening the windows of the two opposite sides, according to the way the wind sets at the time, shutting them quickly when necessary; for in cold, windy, or damp weather, the sooner the windows are again closed, the better. Indeed, to the management of the cellar in this particular, much of the success of dairying is to be attributed: cold and damp air being unfriendly to the secretion of cream, and its proper and entire separation from the milk. Hence, therefore, it is a bad practice to set the pans on the brick floor of the cellar; they ought always to be placed around on shelves, about three feet in hight, and these, after being well washed with hot water, should be wiped quite dry, that no mouldy evaporation might take place to spoil the butter. The air near the floor of a dairy is always impure, being loaded with acid vapors and putrid exhalations, the density of which confines it to the lowest part of the room; hence it is, that the doors of some dairies are made with lattice work, that the air near the floor, as well as that near the ceiling, might be ventilated at the same time: these lattices being furnished with sliding panels, to be kept closed in bad weather. The milk cellar ought always to have a northern aspect, and be well shaded by trees, not growing too near the windows, so as to impede a dry current of air, or to create a moist atmosphere: this consideration being of more importance than would readily be imagined.

"Cellars thus constructed and carefully attended, will, no doubt, supersede the use of spring houses generally, before many years have passed away; by which the business of the dairy will be rendered more agreeable, less laborious, and far less inimical to the health of those, particularly of females, whose occupation it is to attend to its never ceasing duties."

NOTE.—*On the composition of floors for Meat Houses, Dairies Quarters, Poultry Houses, &c., to guard against rats, and to promote dryness and cleanliness.*

Of what use it, that the good housewife takes pains to secure a good stock of poultry, and a good supply of the best butter, and bacon of the finest quality, if the husband does not take care that proper houses are constructed for their preparation and preservation? Every own knows how liable they are to be infested with rats, if pains be not taken to guard against them, especially in *making the floors rat proof.*

To speak now of the *meat or smoke house*, more particularly, it should stand on a foundation of brick or stone, going down *below the influence of frost.* Rats, it is well known, will go down on the outside of the wall, and burrow under it and come up inside. It is said that if in building the foundation wall, you project it *half brick* in a continuous line all round, at *some distance below the ground* on the outside, you will arrest the subterranean operations of the enemy. 'Tis said that the rat always burrows *close* to the wall, and that when he reaches the projecting line of brick, obstructing his perpendicular descent, he does not attempt, or cannot burrow *round it*, but gives up his felonious design as a bad job. We believe in the truth of this suggestion, but whether or not, his ravages may be prevented, and other great inconveniences avoided, by making the floor to out houses, in the manner described below. We obtained the directions from Col. TOTTEN, whilst, as will be seen by the date, we were in the Post Office Department at Washington; but always giving our leisure time to such service as we could render, without fee or reward, to the cause, to which we are now devoting all our time, not only for our own bread, but to teach how bread may be best increased for the commonwealth.

Of Col. Totten, it would seem vain for us to speak as a West Point graduate, and one of the most scientific officers of the army; whose attainments do credit to that branch of the public service.

Among the books, by-the-bye, which ought to constitute every Farmers' Library, is "TOTTEN ON MORTARS," being "*Essays on Hydraulic and common Mortars and on Lime burning.*"

Engineer Department.
WASHINGTON, Nov. 11th, 1844.

MR. J. S. SKINNER, Washington, D. C.

SIR: In compliance with your request, I send you a description of a concrete that will answer a good purpose for floors, &c.

The mortar is to be made of one part of sand to one-half part of hydraulic cement, measured in rather stiff paste. Then one part mortar, thoroughly mixed, is to be united with two and a half parts broken stone or bricks, the largest pieces not exceeding 4 oz. in weight, or of gravel of similar sizes, or of oyster shells, or of either or all of these mixed together. These coarse materials must be free from sand or dirt. The concrete thus made, must be put down in a layer of not more than 6 inches, which will be about the proper thickness for the floor; rammed very hard, and until all the coarse particles are driven out of sight; care being taken to bring the top of the mass into the true place of the floor by the first process; no subsequent addition of plaster being admissible. By the help of a straight edge drawn over guide pieces, the top surface may be made smooth and even by the first operation.

The concrete should contain no more water than is necessary to give the requisite plasticity to the mass. The floor should be covered as soon as finished, with straw or hay, which should be kept wet for several days, the longer the better.

A little lime in paste, may be substituted for an equivalent part of the cement paste, but the less lime mixed with the cement paste, the better.

FLAX AND HEMP HUSBANDRY.

We have elsewhere, and more than once, intimated our sense of the importance of that branch of American Industry which has for its object the production of the *Fibre Crops*. Of Cotton we have already treated pretty fully, and shall return to it whenever any thing may offer seeming to be calculated to improve the cultivation, or to advance in any way the interests involved in its production. We should rejoice to have the interests referred to in the heading of this paper, fall into hands as well able to illustrate them, as were the natural history, growth, and value of the Cotton crop, by Mr. Seabrook.

Opening wide our pages to the elucidation of this and every other industrial pursuit of the country, we proceed now to give some views of the results of Flax and Hemp culture in Ireland, which appear to be well calculated to engage the attention of all Americans interested in their growth in this country.

If Mr. Billings has supplied the desideratum so much wanted in the *work of preparation* for the manufacturer, which he supposes he has, and to which we referred in our last, a most important advance will have been made in the progress of improvement and great acceleration and breadth will have been added to it as a source of national industry and wealth. We invite consideration to the subject. The reasoning of Doctor Kane to show that it need not be attended with exhaustion of the land is new and highly important.

In relation to the actual agricultural and manufacturing industry of Ireland, it is still more important to describe the circumstances of those crops which have for their ultimate and valuable product the vegetable fibre. Of these fibre crops, those of most interest are flax and hemp, especially the former, on which so large a proportion of the population of the north of Ireland may be considered to depend for subsistence.

The Flax plant, to which I shall first direct attention, may be cultivated on any soil of moderate fertility, but, of course, will grow in great luxuriance, and yield its largest produce, where the land is most fertile.* It is, however, indispensable that the soil be rendered thoroughly open and perfectly clean. The order of rotation with other crops varies in different countries, but on the Continent, as in Belgium, where its cultivation is best understood, the ordinary custom is, to bring it in after a corn crop, and not to introduce it into the course more frequently than once in seven years. The flax is a very exhausting crop, and hence requires abundance of manure, which is supplied to it in Belgium, in the most effective form, as liquid manure. It will be shown, immediately, that the flax contains but little lime, the presence of which, in a caustic form, in the soil, appears to be injurious to the plant, hence it is proper, where lime has been necessary to the soil, to intermit the culture of flax for a certain season [until decomposed].

The composition of the soil on which the cultivation of Flax may best be carried on, being a problem of the highest practical interest to this country, the Flax Improvement Society of Ireland, in pursuance of their laudable objects in promoting this branch of industry, commissioned me to make analyses of some soils which had produced remarkably good crops of Flax. The soils were all light clay loams, and afforded the following results, which I extract from the Report of the Society:

	No. 1.	No. 2.	No. 3.
Silica and silicious sand	73·72	69·41	64·93
Oxide of iron	5·51	5·29	5·64
Alumina	6·65	5·70	8·97
Phosphate of iron	·06	·25	·31
Carbonate of lime	1·09	·53	1·67
Magnesia and alkalies, with traces of sulphuric and muriatic acids	·32	·25	·54
Organic matters	4·86	6·67	9·41
Water	7·57	11·48	8·73
Total	99·78	99·58	100·11

The organic matter in these soils was rich in nitrogen; their fertility is, therefore, from the analyses, easily understood.

A point which may be noticed in relation to the growth of Flax is, its quality is essentially improved [finer fibre] by thick sowing. This arises, not from there being more Flax grown, but from the closeness of the plants forcing them to grow upwards with a single stem to gain access to the air, and thus to prevent their branching, by which the fibre is shortened and rendered irregular. Every thing in the cultivation of this plant is subservient to the formation of a long and delicate woody fibre, and it is owing to this fact in the practical history of the Flax, that certain sources of economy in its Agriculture, which I shall point out become practicable.

The ligneous or woody fibre, which finally is converted into the linen thread, is composed of the same elements as starch and sugar, and in nearly the same proportions. Omitting certain minute differences between the true fibre and the matter which occupies its cells, its composition may be expressed by the formula $C_{18} H_{12} O_{12}$ and, when pure, it contains no inorganic matter. Its elements are, in 100 parts:

Carbon	50·00
Hydrogen	5·55
Oxygen	44·45

Hence this fibre, which constitutes the entire

* Coarse fibre on fertile soil, sown in equal quantities. It is indigenous on the Wolga and the Uralian Mountains. [*Ed. Farm. Lib.*

money value of the Flax crop, is produced during the life of the plant, by the elements of the atmosphere, and the materials taken from the manure and from the soil are, in reality, employed by the plant in organizing substances which do not make any return to the farmer, but which are, on the contrary, under certain circumstances, considered to be positively a disadvantage. It is, therefore, of importance, that it should be understood that by a proper system, the growth of Flax and similar fibre crops should be destitute of all exhausting influence. That the materials drawn from the soil by such a crop should be found in the waste products of its manufacture, and should be available by being returned to the soil, to restore it to its original condition of fertility. In order to render this principle fully intelligible, I shall enter into some detail regarding the processes to which the Flax is subjected, and the nature of the products obtained from it.

The Flax, when it has grown to suitable maturity, according as the design is to allow it to ripen its seed or not, is pulled, and either immediately, or in the next spare season, according to the circumstances of the locality, it is subjected to the process termed rotting or watering. In the stem of the Flax there may be recognized three structures, the outer skin or epidermis, covering a close network of fibres which encloses the plant as in a sheath, and in the centre a stem of dense pithy material. The fibrous network is connected together by a glutinous matter, which must be decomposed before the fibres can be separated from the stem, and it is to soften and rot this substance that the plant is steeped. If the steeping be continued too long, the fibre itself may rot, and be weakened and injured in quality; if the steeping be not continued long enough, the fibres are not thoroughly separated from each other, and the quality of the Flax is coarser than it might be.* The general tendency is not to rot the Flax enough, but it is a process requiring very careful management and attention, to conduct it with the greatest advantage.

In order to ascertain what occurs during the steeping of the flax I instituted chemical examinations of the substances and process. I have already given the composition of the pure ligneous fibre, and in the following tables are shown the results of my analyses of the composition of the Flax stem as it grows, and of the ashes which it yields. These are in fact its organic and its inorganic elements. The composition of the ash varies very sensibly with that of the soil upon which the plant is grown, but it is not necessary to introduce that consideration for the present object.

FLAX PLANT.

Carbon	38·72	Oxygen	48·39
Hydrogen	7·33	Ashes	5·00
Nitrogen	·56		
Total			100·00

ASHES OF FLAX PLANT.

Potash	9·78	Sulphuric acid	2·65
Soda [sea air]	9·82	Chlorine [sea air]	2·41
Lime	12·33	Carbonic acid [air, charcoal]	16·95
Magnesia	7·79	Phosphoric acid	10·84
Oxide of iron and alumina	6·08		
Silica	21·35	Total	100·00

Note.—Phosphate of lime and potashes must be valuable and important restoratives.

[*Ed. Farm Lib.*

* The fibre is broken and will shorten the Flax, making waste in the subsequent processes. I do not see that it can make it *coarser*. [*Ed. Farm. Lib.*

When the Flax is steeped, the water acquires a darker color, a disagreeable odor, and, it is well known, becomes poisonous to fish. This arises from the solution of the glutinous material which had cemented together the pure fibres. To examine this material, I employed it as it is produced when the steeping water is dried down, and the following tables show its organic composition, and the composition of the ashes which it yields. I term this substance, for brevity sake, Flax-steep extract.

	Flax-steep Extract.	*Flax-steep Extract without ashes.*
Carbon	30·69	52·93
Hydrogen	4·24	7·31
Nitrogen	2·24	3·86
Oxygen	20·82	35·90
Ashes	42·01	
Total	100·00	100·00

It is thus seen, that the steep-water dissolves out a great quantity of nitrogen, and of the inorganic materials of the stem; in fact that it removes from the plant almost every thing that the plant removes from the soil. This is confirmed by looking to the composition of its ashes, which are shown by the following analytical results. There are found 42 parts of ashes, in every 100 parts of flax-steep extract, consisting of

Chloride of potassium	3·8	Phosphate of lime	2·1
Sulphate of potash	4·4	Carbonate of lime	4·0
Carbonate of potash	3·8	Carbonate of magnesia	2·0
Carbonate of soda	13·2		
Silica	5·5		
Phosphate of iron and alumina	3·2	Total quantity, pr cent.	42

The steep-water thus dissolves, especially the alkaline ingredients, and the phosphates of the plant, and hence leaves the rotted stems in a condition of almost pure ligneous matter.

The stems of the plant, after having been thus steeped, undergo a rough bleaching and drying, by being *grassed* for some days. They are then broken by the hackle, and finally, the fibre separated from the residual woody pith or chaff, by the operation of scutching. These operations may be carried on either by hand or by machinery, and the relative value of the systems may hereafter require attention. The fibre, after these processes, is sent to market; it passes into the hands of the linen manufacturers, and becomes the element of mechanical industry, such as has been treated of in the earlier chapters of this work.

Now, the agriculturist should steadily bear in mind that the fibre which he sells to the flax spinner has taken nothing from the soil: all that the crop took out of the soil he has still in the steep-water, and in the chaff of the scutched Flax, and if, after suitable decomposition, these be returned to the land, the fertility of the latter will be restored, and thus materials, at present utterly neglected, and even a source of inconvenience, may be converted into most valuable manure. [Very important, and entirely forgotten by growers.]

That the water in which Flax has been steeped possesses powerful influence as a manure, has been observed by various persons; thus round the edges of bog holes used for steeping, a luxuriant and tender herbage often arises in vivid contrast to the surrounding barren peat. Various agricultural authorities have noticed its beneficial effects when experimentally used, but I shall only quote, in order to show the at-

tention it deserves, the following notice by Mr. Wakefield: "The water in which Flax has been immersed is, in Ireland, entirely neglected, but Mr. Billingsby mentions it as an excellent manure, and no country in the world, perhaps, affords better opportunities of employing it than Ireland. I made frequent inquiries about it, but could never hear of a single instance of its being used. The author of the Survey of Somersetshire (Mr. Billingsby) says: 'it is observable, that land on which rotted Flax is spread to prepare it for hackling, is greatly improved thereby, and if it be spread on a coarse sour pasture, the herbage will be totally changed, and the best sorts of grasses will make their appearance. Having myself cultivated Flax on a large scale, and observing the almost instantaneous effect produced by the water in which the Flax was immersed, I was induced, some years ago, to apply it to some pasture land, by means of watering carts similar to those used near London for watering the roads. The effect was astonishing, and advanced the land in value ten shillings per acre.'"

The chaff remaining after the scutching might also be formed into manure, and has actually been found of as much value as its composition would indicate. Thus, in fact, the farmer sending to market only the fibre of the Flax, which derives nothing from the soil, has the opportunity of economizing in other and highly remunerating modes all the residual materials.

This chaff was found to consist of

Carbon	50·34	Oxygen	41·52
Hydrogen	6·33	Ashes	1·57
Nitrogen	·24		
Total			100·00

Its nutritive quality cannot be material, but mixed with the water of the Flax-steep, it should complete the restoration to the soil of the constituents of the growing Flax.

The average produce of scutched Flax, as given by Wakefield, reduced to the statute acre, is 543 lbs. from nineteen gallons of seed. This is thirty-four stones of sixteen pounds. The usual produce of Scotland is stated by Low to be forty stones, and at present by the Reports of the Flax Improvement Society, the produce in the north of Ireland may be taken as averaging forty-two stones. The weight of the Flax straw, when quite dry, may be taken as approximating to about two tons.

Mr. Crosthwaite, whose intimate acquaintance with all branches of this industry renders his authority highly valuable, considers that there are about 100,000 acres under Flax in Ireland, and that the produce is about 30,000 tons, of an average value of £50 per ton. This is 6s. 3d. per stone, and should give about £12 10s. for the usual produce of the statute acre. The quantity of Flax grown appears to be on the increase, and its quality also to be improving, as by the Report of the Flax Society it appears, that the amount of the crop in 1841 was 25,000 tons, averaging £45 per ton, whilst in 1843 it was 36,465 tons, and the average value was considered to be at least £55. This increase of value being, if not wholly, certainly in great part, attributable to the exertions of that very useful Society.

Where so much depends on the mechanical and chemical treatment of the plant after the crop has been pulled, it is easily conceivable that under the ordinary circumstances of the Irish farmers, it is difficult to carry out the preparation of the fibre, so as to give it the best quality, and in fact in Belgium and Holland, where the Flax cultivation and manufacture are in their most advanced state, the growth of the plant and the fabrication of the fibre are totally distinct occupations. The crop is purchased by a factor, who takes the dressing into his own hands, and, being devoted to that one department, is acquainted with all mechanical arrangements and details necessary to success, and it frequently happens that the farmer actually obtains for the crop, as grown, more money than he should have obtained for the imperfectly dressed produce of it, and is spared the loss of time, of labor, and interference with other business, which, retaining the mechanical treatment of the Flax in his own hands should necessarily entail upon him. In the present state of industry, I conceive the general adoption of the system of factors as indispensable to progress. Without improvement in quality of product, the manufacture cannot extend, and without the preparation of the fibre being taken up and cultivated as a distinct profession, no important amelioration in it can be expected.

From the importance of the Flax culture, as well to the farmer as to the manufacturer, it might be supposed that it should be at least cultivated to such an extent as to supply our own industrial wants. Such, however, is far from being the case; every year a large quantity of Flax is imported into Great Britain and into Ireland from the Baltic ports, and from Belgium; the total quantities for three late years are shown in the following table:

WHENCE IMPORTED.	1840. Tons.	1841. Tons	1842. Tons.
Russia	43,520	48,472	40,720
Prussia	6,779	5,533	5,624
Germany	405	519	815
Holland	5,650	6,024	4,828
Belgium	4,032	4,865	2,475
France	2,164	1,477	866
Other countries	99	478	385
Total tons	62,649	67,368	55,713

It is worth observing, that the diminished importation of 12,000 tons of 1842, is almost exactly the quantity by which, owing to the exertions of the Flax Improvement Society, the home crop had been increased at the same period.

The agricultural employment which the Flax crop gives, may be estimated from a statement by Mr. Blacker, whose ability as a judge is so well known; he says: "After the most minute calculation by practical men engaged in the growth of Flax, the labor necessary for every acre of Flax is computed to be seven days of a man, fifty-four days of a woman, and four and a quarter days of a horse. Now 55,610 tons, weight [which was the import in 1833, when Mr. Blacker wrote], supposing each statute acre to produce four cwt. which is a full average crop, would be the produce of 278,050 acres, which, according to the above estimate, would require in labor equal to the employment of 6,488 men for 300 days in the year, 50,015 women for the same number of days, and 3,939 horses for ditto."

It appears thus, that there is twice as much Flax imported into Great Britain from foreign ports, as there is grown in this country, and yet there is no actual impediment to its cultivation, for it appears to be uniformly a remunerating crop, where attended to with ordinary care, and

may, by the proper application of scientific principles to its culture, be rendered one of the least expensive or exhausting crops that the agriculturist can have to do with.

There is finally to be noticed, in relation to the secondary advantages of the Flax crop, the utilization of the seed, either as food or for sowing. It appears now well established, that the fibre is not injured by allowing the plant to form the seed,* and that the seed may be saved in good condition under the ordinary circumstances of our climate. This is a very important addition to the value of the crop: the seed being employed for preparing oil; the residual linseed cake being a very valuable food for cattle, or for manure; or the unripened seed in the capsules, or bowes, as they are termed, may be at once given to cattle. The husks of the seed-vessels have been used as food for cattle in the north of Ireland, and by the testimony of Mr. Nevin, and of Mr. Charley, with remarkable advantage. In fact, it would appear that there is no part of this very remarkable plant that is not directly or indirectly capable of being applied to useful purposes.

The great value of it to this country is, however, that its cultivation supplies not merely a source of agricultural, but also of manufacturing employment. In this respect, it is far more beneficial than a food crop of the same money value, or occupying the same ground. The flax, as it leaves the hand of the farmer, gives a livelihood to the dresser, from him it passes to the spinner, to the weaver, the bleacher, and perhaps to the embroiderer, according to its destination. Mr. Andrews illustrates the actual profit and employment given by the crop described page 331, in a calculation which, after correction of a few typographical errors, stands thus:

"100 stones at 15s.—£75; each stone calculated to produce 5½ lbs. of *dressed* Flax—in all 550 lbs.—spun to 30 hanks to the lb., will produce 16,500 hanks. About 158 females will be employed twelve months in spinning, at the rate of two hanks per week (six working days); wages for spinning each hank, about 1s. 8d., or nearly 7d. per diem for each spinner. This quantity of yarn would make 210 webs of cambric pocket-handkerchiefs, each web containing five dozen. About 18 weavers would be twelve months weaving this quantity, allowing each man a month for each web (17½ weavers exactly); wages per web, £2; or from 9s. 6d. to 10s. per man per week. About 40 females would be employed twelve months in needle-work (hemstitch or veining); each could do *one* handkerchief on each working day; wages 8s. per dozen, or 8d. per day. The goods, when finished, would be worth £2 10s. per dozen.

158 spinners 12 months, or 52 weeks, at at about 3s. 4d. per week	£1,369	6	8
18 weavers 12 months, at £24 per ann.	432	0	0
40 needlewomen 52 weeks, at 4s. each per week	416	0	0
216 persons employed.			
Amount of wages	£2,217	6	8
Cost of Flax	75	0	0
	£2,292	6	8
Value 1,050 doz. hdkfs, at £2 10s. pr doz.	£2,625	0	0
Profit	£332	13	4

* But the cloth from seed Flax must be bleached chemically, and for certain goods subject to great exposures, as canvass, this is objected to throughout the world. [*Ed. Farm. Lib.*

The realizing of this great amount of value depends on the delicacy given to the fibre, and it is hence that so much is due to the leading members of the Flax Society, for their exertions by example and by publications, for the introduction of the most approved Belgian methods. While thus recognizing the benefits which are likely to accrue to Irish industry from this modern institution, it is important not to forget how much we owe to others. The Royal Dublin Society, almost immediately on its foundation, applied itself anxiously to promote the culture of Flax, and to improve the methods of its preparation. They obtained the assistance of persons well experienced in the Belgian processes, and so early as 1739 published a volume of papers, principally occupied with directions for the growth and treatment of Flax, and which contained, intelligibly laid down, almost every detail of the processes now being introduced as the newest and most advantageous. Owing to the disastrous social condition of the country, which has so kept it back in every branch of peaceful enterprise, the beneficent intentions of the Royal Dublin Society were not carried out, but now that with renewed energy, it labors to awaken Irish industry, that it possesses in numerous junior societies so many active coöperators, and that the people, by education and steadiness of habits, are become more fitted for the pursuits of peaceful industry, it is to be hoped that the seed shall no longer be scattered upon an unfruitful soil, but spring forth with a sound and vigorous vegetation, which may bring peace, abundance and contentment to the land.

It only remains to indicate, in a general manner, the extent to which the mechanical manufacture of Flax is prosecuted in this country. In the work on Ireland, published by Mr. and Mrs. Hall, some statistical results are given, which they obtained by personal inquiry in Belfast, and which, though probably above the truth, are not more exaggerated than is usual with such general estimates. They consider that there are in Belfast, now at work, 155,000 spindles, consuming 210 tons of Flax per week, and that there are employed in the manufacture of Flax, 170,000 hands. They estimate the total number of persons supported by the linen trade as not less than half a million; that the annual value of the linen cloth manufactured in Ulster is not less than £4,000,000: the capital involved in its production not less than £5,000,000, and that the annual amount of wages paid to those engaged in the manufacture amounts to £1,200,000. This sum, for the 170,000 above mentioned, would make the average wages to be only 2s. 9d. per week.

The extent of this manufacture stands in such relief from the usual absence of all manufacturing industry in Ireland, that we frequently attach to it a degree of importance and an idea of absolute magnitude that it does not really possess. Thus we often hear the linen manufacture spoken of as being the staple of this country, whilst wool and cotton are in return the natural manufactures of the sister kingdom. In reality, however, Ireland is almost as much behind in this as in every other branch of industry. The town of Dundee alone is considered to manufacture as much linen as all Ireland, and the relation which the manufacture of Flax bears in the three kingdoms is exactly shown in the following table, which is extracted from the Report of the Factory Inspectors for 1839,

since which period no sensible alteration has taken place.

In England there were 169 mills, worked by 4,260 horse power, and employing 16,573 persons.

In Scotland 183 mills, worked by 4,845 horse power, and employing 17,897 persons.

In Ireland 40 mills, worked by 1,980 horse power, and employing 9,017 persons.

It is difficult to reconcile this official return with the estimate of Mr. Hall, just before quoted; as the proportion of home-spun and woven linen goods can scarcely be so considerable as to account for the discrepancy.

Finally, the following extracts from official tables will show, as far as documents allow, the actual, or at least recent, extent of the export trade in linen products.

Export of Woven Linen Goods, in Yards.

Years.	*To Great Britain.*	*To Foreign parts*	*Total.*
1810	32,584,545	4,313,725	36,898,270
1815	37,986,359	5,496,206	43,482,565
1820	40,318,270	3,294,948	43,613,218
1825	52,559,678	2,553,587	55,113,265

Re-Export of Irish Linen and Sail-Cloth, from Great Britain to Foreign Parts, in Yards.

Years.	*Irish Linen.*	*Irish Sail Cloth.*
1824	17,933,195	1,593,291
1827	14,022,496	2,211,529
1830	13,244,269	1,922,211
1833	9,561,277	2,229,777

Latterly an extensive trade with the Continent has sprung up, in the exportation of linen yarns, replacing, to a certain extent, the export of woven linens. The money values exported were

Years.	*Linen.*	*Yarn.*
1837	£77,272	£3,164
1840	63,847	172,602
1842	31,401	169,449

Such are the general conditions of this important branch of manufacture. It is needless for me to point out how strenuously our efforts should be directed to the extension of a branch of industry which, in its various departments, affords, from a given surface of land, employment to a greater number, and a greater variety of individuals, than any other branch of human occupation. The agriculturist, the mechanist, and the chemist, are all equally occupied with its preparation; and, certainly, the natural circumstances of the country are such as to adapt it, in a singularly perfect manner, for the development of the flax and linen manufacture, to an indefinite extent.

The linen manufacture has been, hitherto, almost exclusively confined to the north of Ireland. This does not arise from any physical circumstances of soil or climate, or from the greater facilities of access to mechanical power; on the contrary, the soil of Ulster, if we except the valley of the Lagan, and some scattered districts, is not, by any means, equal to the soils of the south and centre. The growth of this department of industry in Ulster, is owing rather to moral causes. Its population was, essentially, of a class devoted to industrial pursuits, and eager after the independence and power which pecuniary success confers, and which was within their reach; whilst in the south, the wretched remnants of feudal barbarism paralyzed all tendency to improve. The lord was above industry; the slave was below it; and hence, although the circumstances of a fertile soil, easy access to markets, and abundance of motive power, were, in themselves, favorable, the blessings which nature presented were left unutilized, by the ignorance and inertness of the people.

In fact, if we consider the situation of those countries in which the manufacture of linen and other Flax products has become the characteristic fact of their industrial history, we shall find the soil and geographical condition quite different from those of the north of Ireland. In Egypt, whose dignitaries were clothed in purple and fine linen, and from which the culture of Flax has spread over the civilized world, the soil was formed by the mud carried down in the overflowings of the Nile, and spread over the surface of the lower country along its banks. The soils of Belgium and Holland, the countries now most remarkable for the excellence and abundance of their Flax industry, have been produced by the accumulated mud deposited by the vast rivers, which, draining the greater part of Europe, discharge their waters into the German Ocean, by numerous channels. The rivers which flow into the Baltic afford, also, on the low grounds along their banks, the seats of the Flax Agriculture of Russia and Northern Prussia; and, guided by these analogies, may we not ask, where are the similar soils, or districts, in our own country? They are abundant and available along the line of the principal river. The lands hitherto liable to flood, by the irregular risings of the Shannon, but, by the improvement of its channel, about to be permanently rendered available to Agriculture, amount to not less than 32,500 acres above Limerick, whilst below that city, the caucasses, or marshy grounds, of the extraordinary fertility mentioned by Wakefield, are to be found. Such soils afford the most complete parallel to those districts of Egypt and of Belgium, which have been for ages the seats of the growth of Flax. The water power at Killaloe, fully described before, places at the hands of the manufacturer, the means of every mechanical preparation of the crop. The river furnishes for 200 miles the most convenient access to domestic markets, and the port places him under equally favorable circumstances for the foreign trade. So remarkable a combination of facilities for industrial success is rarely to be met with.

The Flax had formerly been actually cultivated to some extent in certain parts of the south and centre of Ireland, and the quantity of produce obtained was found decidedly greater than the average of the crops given in the north of Ireland. I am informed by experienced persons, also that the quality of the fibre was of a delicacy but seldom met with in the ordinary Flax of Ulster. Neither the cultivation nor the manufacture was adopted by the people with the energy and patience which alone can lead to success. The encouragement to industry was unhappily associated with other objects, which deprived it of all power of really bettering the condition of the people; which interposed between those who might have served as efficient teachers, and those who were to derive instruction, a barrier which, it is to be hoped, the experience of centuries has at last shown cannot be removed by measures of cruelty or menace.

Connected with the cultivation of Flax, as a department of Agriculture, and of subsequent

mechanical industry, is that of hemp, which, in all its states, indeed, bears an almost perfect analogy to the growth and preparation of Flax. During the war, when access to the Baltic, whence the great supply of Hemp is drawn, was difficult, this plant was cultivated in this country with some success. The crop appears to require a good soil, and in its preparation a degree of care which the general run of farmers were not capable of applying to it, and hence, since that period, the attention of agriculturists having been exclusively fixed on corn and other food crops, its cultivation has been totally abandoned.

The constitution of the Hemp plant is almost exactly like that of Flax. It is pulled, with suitable care in regard to the ripening of the seed, which its diœcious structure requires. The plants are steeped, until the gummy material which connects the fibres is softened and rotted off, and then, after drying and a certain amount of bleaching on green land, the fibrous skin is peeled from the stems, and the fibre obtained clean by scutching with appropriate instruments. The Hemp fibre, like the Flax fibre, consists of purely woody matter, having the chemical composition of $C_{18}\ H_{12}\ O_{12}$, and contains neither nitrogen nor saline matters. It is hence formed in the plant by the agency of the atmosphere alone, and the materials which the plant extracts from the soil, or from the manure used in its cultivation, are found, not in the fibre, but in the waste of the processes of its preparation. The water in which it had been steeped, the chaff which remains when the fibre is cleaned off, contain various substances, which, when properly returned to the soil, give it back all that the plant in growing had removed from it, and hence would restore its original condition of fertility. In this way the Hemp may, like Flax, be rendered one of the least exhausting crops, and the profit on its cultivation increased, of course, in the same proportion.

In order to establish these principles by chemical analyses, I instituted an examination of the Hemp plant and its products, analogous to that which has been already noticed regarding Flax. The following were the results. The Hemp plant consists of:

	The Stem.	*The Leaves.*
Carbon	39·94	40·50
Hydrogen	5·06	5·98
Oxygen	48·72	29·70
Nitrogen	1·74	1·82
Ashes	4·54	22·00
Total	100·00	100·00

The ashes of the plant (stem and leaves), consisted of:

Potash	7·48	Silica	6·75
Soda	·72	Phosphoric acid	3·22
Lime	42·05	Sulphuric acid	1·10
Magnesia	4·88	Chlorine	1·53
Alumina and oxide of iron	·37	Carbonic acid	31·90
Total			100·00

When the Hemp is steeped, the water acquires very strongly narcotic properties and a disagreeable odor. On drying it down a brown extract is obtained, which was composed of:

Carbon	28·28	or	55·66
Hydrogen	4·16	or	8·21
Nitrogen	3·28	or	6·45
Oxygen	15·08	or	29·68
Ashes	49·20	Without the ashes	
Total	100·00		100·00

This material contains so large a quantity of nitrogen, as well as of saline matters, as to show that when it had decomposed it should become a most valuable fertilizer.

The steeped Hemp stem, as it remains after pulling off the loose fibrous coat, is little more than ordinary wood. It contained:

Carbon	56·80	Oxygen	34·52
Hydrogen	6·48	Ashes	1·77
Nitrogen	0·43		
Total			100·00

The cultivation of the Hemp is not likely to be in future as important as hitherto it has been. The substitution of iron for Hemp in the standing rigging of ships, and the introduction of coarse Egyptian Flax in the manufacture of various fabrics where previously Hemp had been used, will probably limit very much its consumption. It is only from its close analogy to the Flax, and the identity of principle by which so much economy may, as I believe, be introduced into the cultivation of both, that I have here noticed it, even thus briefly.

I have endeavored, in the foregoing observations, to notice briefly the questions regarding Irish Agriculture, which appeared to me most intimately connected with its position as an important branch of industry. It has been shown that the amelioration of the processes of cultivation requires a very extended knowledge of chemical and mechanical science. That husbandry as an art, so far from presenting the monotonous and almost passive routine in which rustic existence has been dreamed away, requires to be placed parallel with the other great departments of human occupation, in the amount of intelligence which its successful practice calls into play.

Until, by suitable education, the minds of the agricultural population of all classes are awakened to a knowledge of what their art really depends upon, all secondary exertions for its improvement must be completely futile.

There exist in Ireland millions of acres of land perfectly well adapted for cultivation, but which have never yet supplied a morsel of food for man.

It is well established that on the lands actually cultivated there might be raised three times the amount of food that is now produced, were a suitably improved system of Agriculture brought into general use.

And yet there exists in Ireland a population starving and unemployed, wearing out a miserable existence on the charity of those only a degree less wretched than themselves, or supported by a tax levied on the industry of the more energetic and more instructed classes.

Were the true conditions of agricultural success generally understood, such could not be the case. The cultivation of these wastes, which, as evidence of the most decisive and practical character has shown, can be easily and economically reclaimed, would give remunerative occupation to hordes of those who now are among the weightiest burthens of the land. The productiveness of the soil being augmented by proper drainage and deep working, and the pastoral system replaced by the turnip and green crop husbandry, by which so much more food is raised and so much more employment given, it would be found that, so far from the existing numbers of the people being too great to be supported by the soil, the new conditions of agricultural activity would provide means of profitable occupation for a much greater number than that proportion of our population which can, even now, be considered as dependent on it for the means of life.

ONE-HORSE CARTS.

BY EDWARD BOWLY, SIDDINGTON, NEAR CIRENCESTER.

PRIZE ESSAY.....From the Journal of the Royal Agricultural Society of England.

HAVING had five years' practical experience in the use of wagons, and nearly the same time of one-horse carts, on a farm of 170 acres of arable and 80 acres of pasture land, I have arrived at a satisfactory conclusion as to the comparative advantages of the latter. I will, as briefly as possible, point out what I consider to be those advantages.

We must first consider the saving of capital in entering a farm by employing one-horse carts instead of wagons. From the great variety of soil it is difficult to form a just estimate of the amount of horse-power required to cultivate a given quantity of land. We may, however, to a certain extent do so by taking for our purpose land of medium quality, of which description my own farm consists. I have no light plowing land, nor have I more than 20 or 30 acres of very heavy land. I will, therefore, relate my actual experience. In the employment of wagons and the old broad-wheeled dung-carts, I required one wagon, one cart, and three horses to every 50 acres of arable land. I also kept a light cart for general purposes. Now that I am employing carts, I find that I get through my work much more easily with two horses and two carts to 50 acres. The following is a fair calculation of the first outlay under the two systems:—

1 wagon	£25 0 0
1 dung-cart	15 0 0
3 horses	60 0 0
Extra harness	2 0 0
Proportionate cost of the light cart to 50 acres	3 0 0
Total	105 0 0
Two 4-inch wheel one-horse carts	£25 0 0
Two horses	40 0 0
	64 0 0
Balance in favor of carts	41 0 0
Total	105 0 0

This shows a saving of upwards of 16s. an acre, which many young farmers would find extremely useful to expend in stock or implements. There is also some annual saving in the expense of the repairs under the cart system, as well as that of the keep of one horse to every 50 acres. I believe there are those who think this of little importance; that they can keep horses at a very small expense, say from 3s. to 5s. per week; and that if fewer are kept, they must be fed more highly, and therefore the cost is much the same, forgetting that the more horses are kept the greater number of hands are required to attend them, whose time also is wasted if the animals are not in a state to do a good day's work; nor is the manure nearly so valuable as when the horses are kept in a better state. To estimate the saving of keeping one horse less to 50 acres, I will make my calculations from my own method of keep. I have not for years allowed my horses any hay. In winter I give them 10 lbs. of corn, [meaning oats or barley] 10 lbs. of carrots or swedes, and as much straw-chaff as they will eat, per diem. The corn I value at 6s. per week, the roots at 9d., and the straw with expense of cutting into chaff 1s. 3d., making in the whole 8s. per week, which, with 1s. for shoeing, &c., amounts to 9s. [or $2 25.] In the summer I give them green clover or vetches, without corn, which I value at 5s. per week, making 6s. with 1s. added for shoeing, &c.; the average therefore for the whole year will be 7s. 6d. each horse. It therefore follows that if we can save one horse in the cultivation of 50 acres, it will amount to nearly 8s. per acre.

I will now proceed to the working of the system. It is, I believe, generally admitted that one horse attached to a given weight, will move it more easily than two horses attached to double that weight. This arises not only from the advantage gained by having all the power of draught close to the work, but also all the power applied at the same moment, which is almost impossible where two or more horses, having different wills and steps, are attached to the weight; and for the same reason one horse will travel more quickly singly. I have often heard it remarked as teams have passed "how well the horses pull together," when, perhaps, they have been moving at something less than two miles an hour; but hasten them to four miles an hour, and this steady working team will draw very uneasily, one horse pulling to the right hand, another to the left; therefore a great saving of time is occasioned in the quickness of motion with one horse carts. When a cart is filled there is no delay in attaching the trace-horses, during which operation the one horse would be two hundred yards on the road. I know this might be done more quickly by having men ready to change the horses, as is the practice of opposition coaches, but I am speaking of the matter-of-fact working of the system. Then again, when the load is deposited, the one horse turns in much less time than the two or three. These facts are too self-evident to admit of contradiction; indeed, I believe the economy of carting manure with one-horse carts is generally allowed, but the employment of them in harvesting is much objected to. In this respect, however, I find them equally expeditious and economical. My actual experience is that three carts, with the harvest frames attached, will convey as much hay or corn in the straw as two wagons, and that they are bound with the ropes in the same time, therefore no time is lost in

binding. They are easier to pitch to than wagons, and not more difficult to unload; and all the advantages are gained of speed in traveling.

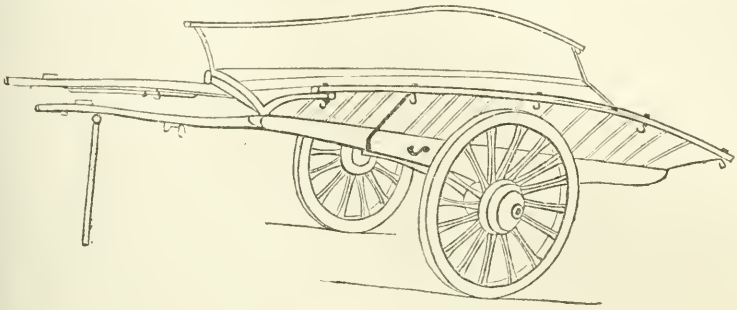
The facility with which carts are set to a rick, as compared with wagons, will effect a much greater saving of time than in working from a heap of manure; you can also draw the carts to all sides of the rick, thereby avoiding the inconvenience of drawing your rick aside by the great treading there generally is on the side on which you unload the wagons, the usual practice being to unload all on one side, from the wagon being too unwieldy in turning to be set at the other sides. My system in carrying a field, what we call "double handed"—that is, with two pitchers and two loaders—is to commence with one cart, having one pitcher and loader, and when that is half loaded to start another with the other pitcher and loader.—When the first is filled it goes to the rick, and is followed by the others in succession: by commencing in this way we keep on regularly through the day, having two carts loading in the field and two unloading at the rick, and the number of carts employed in going to and fro must be regulated by the distance of the field from the rick; if very near, one will be sufficient, and more than two are seldom required on any farm of moderate dimensions. I conceive it would not be generally useful to mention the time occupied in securing a given number of acres of corn with carts, as so much depends on the bulk of the crop, as well as the power of the men employed. I once accurately remarked the time of such an operation: it was in carrying a very heavy crop of 10 acres of *mown* wheat close to the homestead, which took with five carts four hours and a quarter from the first cart entering the field to the finishing off the rick with the last. The longer the distance of the field from the rick the greater will be the advantage of carts. Supposing each wagon to be drawn by two horses (three are frequently employed,) and that three carts will convey as much as two wagons, which I am certain will be more than borne out in practice; then three horses will take as much in the carts as four in the wagons, and they will perform the distance in little more than half the time. It is supposed that an additional expense attends carts in the number of boys required to go with them: this is not the case; the boys are younger and less expensive than those intrusted with wagons, and the horses do not need any boy in the field, as when they become accustomed to their work they will walk steadily beside the cocks without being attended. There is an impression that carts will not answer in hilly situations; we find, however, they are employed, to the exclusion of wagons, in some of the most hilly counties of England. I have certainly nothing very steep on my farm; but 50 acres lie nearly two miles from the rest of my land, on which road there are two very sharp pitches, up and down which I am constantly taking loads, and have never found more inconvenience with carts than I formerly did with wagons. But, to prevent any possibility of accident, there is now to be had the self-acting drag, which retards the wheels in proportion to the descent; there is also a very simple method of moving the load forward by means of a screw when going up hill, and backward in descending a hill. But I have found the carts I have answer so well without these additions, that I shall not go to the expense of either of these improvements at present. In taking out corn in the sacks, carts will be found far preferable to wagons, as in all the other operations carrying a greater weight with the same ease and in less time, each cart carrying 5 quarters of wheat. Nearly the whole of my wheat goes to a mill seven miles distant, on the road to which there are three steep hills. I always send two carts, carrying five quarters of wheat each, with one lad of eighteen or twenty, going twice a-day; and in summer, when the roads are very good, I have put 5½ quarters behind each horse: thus two horses would deliver 22 quarters in a day.

I have endeavored to answer all the objections I have heard used against one-horse carts, objections which I once strongly felt myself.—My attention was first drawn seriously to the subject from hiring a man to draw some stones for draining. He came with a horse only 14 hands high and a small cart, when the work he accomplished so surprised me, that I at once decided to try two light carts, which, after succeeding well in all other operations, I employed in the harvest field; and being fully satisfied with them in this capacity, I soon discarded every wagon from the farm.

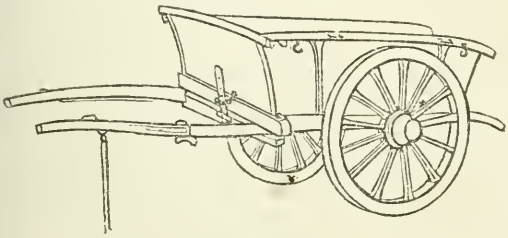
I have carefully endeavored to give a just estimate of the saving in horses and implements by the use of carts; since they were first employed by me I have effected a greater reduction in the number of each than is here represented. When I kept wagons I had not so much land by 20 acres in cultivation as at present; I then kept ten horses, four wagons, three dung carts, and one light cart; I now only keep six carts and six horses. I, however, attribute a portion of the saving to the use of the scarifier in many instances instead of the plow, and I now very rarely put more than two horses to a plow, while at that time I frequently had three; on the other hand, for two years past, I have each year carted 150 loads of night-soil a distance of a mile and a half, and 300 loads of road-scrapings, &c. half a mile, which is two-thirds more than I did during the time I had wagons. I have also done each year the following extra work:—carted 30 tons of potatoes two miles, 60 tons of roots half a mile, subsoil plowed 6 or 7 acres, and carted stones for 15 acres of draining 30 feet distant. I have therefore taken all these things into due consideration, and given the fairest representation in my power.

The description of carts I make use of are, five common Scotch carts and one skeleton cart; those of the former, with narrow wheels, cost me 10 guineas each; and with the 4-inch wheels (which I recommend) £12, with harvest-frame, &c. complete. The skeleton with narrow wheels cost me £10; it will carry more hay or straw than the others, its loads being in proportion of four carts to three wagons—it is more convenient for conveying poles, hurdles, &c.; and one on a farm may be useful, but it will not answer in dung-carting, and its advantages in harvesting are not sufficient to remunerate for the additional outlay of a double set.

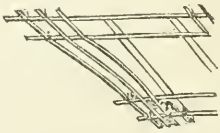
In conclusion, I may remark that the principle of one-horse carts is quickness of motion, therefore load according to the road to be passed over, but never reduce the pace of traveling; and I can assure those who are timid about them, that they are much less liable to accidents of every kind than wagons; and that, however prejudiced the workman may be against their first introduction, when he becomes acquainted with the system he will prefer it.



Skeleton Cart.



Scotch Cart.



Harvest Frame.

A Hint for Agricultural Societies.—We respectfully suggest to the American Institute, and to all Agricultural Societies, that they could not better employ a portion of their funds than by offering liberal premiums to all venders of Agricultural Machinery and of Fruit Trees, Seed, &c. and yet more to individuals not in "the trade," who shall be the first importers and exhibiters of any implement, seed, grain, grass, fruit or ornamental tree, which by a committee of practical men of the Society shall be deemed a valuable acquisition to the country.

We want now a *Hand Seed-Depositor*, lately invented in England, which will deposit the seed at any required depth and distance, and in any required number; and which costs only a few shillings. We want the *St. John's-Day Rye*, unless it be, as we suspect, nothing more than the Multicole Rye, which we have had already; the seed of the "*Gold of Pleasure*"—all of which have been before mentioned in the Farmers' Library—but unfortunately it's every body's business and nobody's to import them. Let liberal premiums be offered, or let a sum be set apart and a committee of importation be appointed, to send for such things as hold out a promise of *practical usefulness*.

Gold of Pleasure.—I shall be obliged to you to inform me whether you or your correspondents know any thing of the Camelina sativa or Gold of Pleasure. It is said to have great fattening properties for sheep and cattle, and I know it to be most productive, from having tried a very small quantity of seed this summer. A farmer near Somerton sowed 3½ lbs. of it, and his son tells me that the produce was 600 cwt. and upwards. It is said to produce an excellent oil. It may be sown on poor land.

George Rous, Laverton, Beckington.

Agriculture in France.—France has of late years pursued a wise, judicious, and liberal policy in regard to her Agriculture. In 1838, there were in that country 123 Agricultural Societies, and 303 Agricultural Committees. Scarcely a movement which could contribute essentially to her husdandry, has been neglected. Pecuniary encouragement to a very great extent is afforded, and agents are sent into other countries, at the expense of the French Agricultural Society, in order to examine their systems of farming, with a view to the more perfect practice of the art at home. In 1803, there were scarcely ten organized Societies in the kingdom. They are now, however, rapidly increasing.

[Genesee Farmer.

THE HYDRAULIC RAM;

OR CHEAP METHOD OF HAVING A CONSTANT SUPPLY OF WATER.

It would be a waste of ink to dwell on the advantages of a constant and full supply of water about the homestead of every man's estate, in the country, and yet every reader may call to mind numberless instances where incalculable inconvenience and privation have been endured, and the most prodigal waste of labor committed from generation to generation, from that *vis inertiæ*, that physical and moral lethargy of character, which too often leads us to drag on through life, neglecting expedients that the least thought would suggest, and the slightest exertion bring to our relief.

For years and years have we known large families to be supplied with all the water needed, or rather all that was used, but not a hundredth part of what was really *needed*, by keeping young persons constantly on the trot, to an unclean spring, sometimes at the distance of half a mile, bringing on their heads pails or "piggins" full at a time, when a cistern of simple construction made tight with water-cement, eight or ten feet in diameter and depth, would collect rain-water enough from the roof of the barn or the dwelling to give a constant supply of drinking water of the very best kind when filtered and iced. Again we have known, may it not be seen every day, where streams of water of the smallest volume might, with a very simple hydraulic contrivance, as we shall show, be made to afford a constant flow of pure water at the door of the kitchen, the dairy, and the stable.

So highly is the luxury of abundant water esteemed in this City, that in almost every house that is built, it is only necessary to turn a cock to have it at pleasure in every room and chamber.

Not aware of any thing more interesting to the Farmer, than the means of having at all times a full supply of water, not only for purposes strictly domestic, but for the use of all his domestic animals and for irrigation in our dry climate, we shall bring to the use of our patrons all the information we can collect, as to the various contrivances which may be resorted to for that purpose—we know how apt they are to be deterred from attempting any thing out of the common track, on account of the supposed or actual expense in the first instance, but a simple calculation of the remuneration to be derived from the saving of labor, and the money value, to say nothing of the luxury, of a fuller supply of water, would convince them that a single year, some times even less, would reimburse them. There is to be considered, for example, as to the use of it for their domestic animals, not only the time that is saved, through the whole winter especially, in sending them to a distance to drink, but that they often suffer from not having a supply when Nature demands. The saving of manure too is not to be overlooked.

Our present purpose, however, is only to transfer for the use of our readers a few pages from a very valuable and interesting work, which ought to be added to the Library of every Farmer as well as every Mechanic, entitled "A descriptive and Historical account of Hydraulic and other Machines *for raising water*, ancient and modern, by Thomas Ewbank," published in 1842 by D. Appleton & Co.

Although, according to this diligent and discriminating author, "the art of raising water, has ever been closely connected with the progress of civilization, so much so indeed, that the state of this art among a people may be taken as an index of their position on the scale of refinement, it seems passing strange that until this entertaining and instructive work made its appearance so recently, no one publication had ever been devoted to the great variety of devices which human ingenuity has devised for raising liquids.

Dry as may seem to be a history of *water*-lifting devices, we hardly know a book from which more curious and refreshing drafts of information might be made, than from this one by Mr. Ewbank, yet now we have not room to spare for that purpose, even if we could venture under any circumstances to give up for mere amusement, pages which can only be so used when amusement may be blended with obvious utility. Accordingly, we can only appropriate at present space for extracts explanatory of the principles and construction of the Hydraulic Ram of *Montgolfier*, which, as will be seen, may be adapted to every location in the country where there is the smallest stream of running water. How many farmers are there who have this invaluable resource unemployed, and who, by placing this paper in the hands of any honest ingenious mechanic, might at small expense have a perennial flow of water at his dwelling and barn-yard, for cooking, washing, bathing,

for watering his poultry, his stock, his dairy and his garden, and for a thousand uses that would suggest themselves, were the water at hand?

Of the machines appropriated to the fourth division of this work, centrifugal pumps and a few others have already been described. There remain to be noticed, the water ram, *canne hydraulique*, and devices for raising water by means of steam and other elastic fluids.

If the various operations of the lower animals were investigated, a thousand devices that are practiced by man would be met with, and probably a thousand more of which we yet know nothing. Even the means by which they defend themselves and secure their food or their prey, are calculated to impart useful information. Some live by stratagem, laying concealed till their unsuspecting victims approach within reach—others dig pitfalls to entrap them; and others again fabricate nets to entangle them, and coat the threads with a glutinous substance resembling the bird-lime of the fowler. Some species distill poison and slay their victims by infusing it into their blood; while others, relying on their muscular energy, suffocate their prey in their embraces and crush both body and bones into a pulpy mass. The tortoise draws himself into his shell as into a fortress and bids defiance to his foes; and the porcupine erects around his body an array of bayonets from which his enemies retire with dread. The strength of the ox, the buffalo and rhinoceros is in their necks, and which they apply with resistless force to gore and toss their enemies.—The elephant by his weight treads his foes to death; and the horse by a kick inflicts a wound that is often as fatal as the bullet of a rifle; the space through which his foot passes adding force to the blow.

There are numerous proofs of some of the lower animals being aware that the momentum of a moving body is increased by the space through which it falls. Of several species of birds which feed on shell fish, some, when unable to crush the shells with their bills, carry them up in the air, and let them drop that they may be broken by the fall. (The Athenian poet Æschuylus, it is said, was killed by a tortoise that an eagle dropped upon his bald head, which the bird, it is supposed, mistook for a stone.) When the males of sheep or goats prepare to *butt*, they always recede backwards to some distance; and then rushing impetuously forward, (accumulating force as they go,) bring their foreheads in contact with a shock that sometimes proves fatal to both. The ancients, perhaps, from witnessing the battles of these animals, constructed military engines to act on the same principle. A ponderous beam was suspended at the middle by chains, and one end impelled, by the united efforts of a number of men at the opposite end, against walls which it demolished with slow but sure effect. The battering end was generally, and with the Greeks and Romans uniformly, protected by an iron or bronze cap in the form of a ram's head; and the entire instrument was named after that animal. It was the most destructive of all their war machinery—no building, however solid, could long withstand its attacks. Plutarch, in his life of Anthony, mentions one *eighty feet* in length.

The action of the ram is familiar to most people, but it may not be known to all that similar results might be produced by a liquid as by a solid—that a long column of water moving with great velocity might be made equally destructive as a beam of wood or iron—yet so it is. Waves of the sea act as water-rams against rocks or other barriers that impede their progress, and when their force is increased by storms of wind, the most solid structures give way before them. The old light-house on the Eddystone rocks was thus battered down during a storm in 1703, when the engineer, Mr. Winstanley, and all his people perished.

The increased force which water acquires when its motion is accelerated, might be shown by a thousand examples: a bank or trough that easily retains it when at rest, or when slightly moved, is often insufficient when its velocity is greatly increased. When the deep lock of a canal is opened to transfer a boat or a ship to a lower level, the water is permitted to descend by slow degrees: were the gates opened at once, the rushing mass would sweep the gates below before it, or the greater portion would be carried in the surge quite over them—and perhaps the vessel also. A sluggish stream drops almost perpendicularly over a precipice, but the momentum of a rapid one shoots it over, and leaves, as at Niagara, a wide space between.—It is the same with a stream issuing from a horizontal tube—if the liquid pass slowly through, it falls inertly at the orifice, but if its velocity be considerable, the jet is carried to a distance ere it touches the ground. The level of a great part of Holland is below the surface of the sea, and the dykes are in some parts thirty feet high; whenever a leak occurs, the greatest efforts are made to repair it immediately, and for the obvious reason that the aperture keeps enlarging and the liquid mass behind is put in motion towards it; thus the pressure is increased and, if the leak be not stopped, keeps increasing till it bears with irresistible force all obstructions away. A fatal example is recorded in the ancient history of Holland:—An ignorant burgher, near Dort, to be revenged on a neighbor, dug a hole through the dyke opposite the house of the latter, intending to close it after his neighbor's property had been destroyed; but the water rushed through with an accelerating force, till all resistance was vain, and the whole country became deluged. The ancients were well aware of this accumulation of force in running waters. Allusions to it are very common among the oldest writers, and various maxims of life were drawn from it. The beginning of strife, says Solomon, "is as when one letteth out water"—the "breach of waters"—"breaking forth of waters"—"rushing of mighty waters," &c. are frequently mentioned, to indicate the irresistible influence of desolating evils when once admitted.

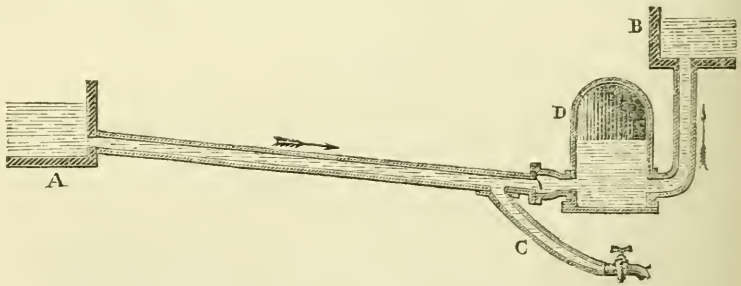
That the force which a running stream thus acquires may be made to drive a portion of the liquid far above the source whence it flows, is obvious from several operations in nature.—During a storm of wind, long swelling waves in the open sea alternately rise and fall, without the crests or tops of any being elevated much above those of the rest; but when they meet from opposite directions, or when their progress is suddenly arrested by the bow of a ship, by rocks, or other obstacles, part of the water is driven to greater elevations. There is a fine example of this at the Eddystone rocks—the heavy swells from the Bay of Biscay and from the Atlantic, roll in and break with inconceivable fury upon them, so that volumes of water are thrown up with terrific violence, and the

celebrated light-house sometimes appears from this cause like the pipe of a fountain enclosed in a stupendous *jet d'eau*. The light-room in the old light-house was sixty feet above the sea, and it was often buried in the waves, so immense were the volumes of water thrown over it.

The hydraulic ram raises water on precisely the same principle: a quantity of the liquid is set in motion through an inclined tube, and its escape from the lower orifice is made suddenly to cease, when the momentum of the moving mass drives up, like the waves, a portion of its own volume to an elevation much higher than that from which it descended. This may be illustrated by an experiment familiar to most people. Suppose the lower orifice of a tube (whose upper one is connected to a reservoir of of water) be closed with the finger and a very minute stream be allowed to escape from it in an upward direction—the tiny jet would rise nearly to the surface of the reservoir; it could not, of course, ascend higher—but if the finger were then moved to one side so as to allow a free escape till the whole contents of the tube were rapidly moving to the exit, and the orifice then at once contracted or closed as before, the jet would dart far *above* the reservoir; for in addition to the hydrostatic pressure which drove it up in the first instance, there would be a new force acting upon it, derived from the *motion* of the water. As in the case of a hammer of a few pounds weight, when it rests on the anvil it exerts a pressure on the latter with a force due to its weight only, but when put in motion by the hand of the smith, it descends with a force that is equivalent to the pressure of perhaps a ton.

Every person accustomed to draw water from pipes that are supplied from very elevated sources, must have observed, when the cocks or discharging orifices are suddenly closed, a jar or tremor communicated to the pipes, and a snapping sound like that from smart blows of a hammer. These effects are produced by blows which the ends of the pipes receive from the water; the liquid particles in contact with the plug of a cock, when it is turned to stop the discharge, being forcibly driven up against it by those constituting the moving mass behind.—The philosophical instrument named a *water hammer* illustrates this fact. The effect is much the same as if a solid rod moved with the same velocity as the water through the tube until its progress was stopped in the same manner, except that its momentum would be concentrated on that point of the pipe against which it struck, whereas with the liquid rod the momentum would be communicated equally to, and might be transmitted from *any* part of, the lower end of the tube; hence it often occurs that the ends of such pipes, when made of lead, are swelled greatly beyond their original dimensions. We have seen some ¾ of an inch bore, become enlarged to 1¼ inches before they were ruptured. At a hospital in Bristol, England, a plumber was employed to convey water through a leaden pipe from a cistern in one of the upper stories to the kitchen below, and it happened that the lower end of the tube was burst nearly every time the cock was used. After several attempts to remedy the evil, it was determined to solder one end of a smaller pipe immediately behind the cock, and to carry the other end to as high a level as the water in the cistern; and now it was found that on shutting the cock the pipe did not burst as before, but a jet of considerable hight was forced from the upper end of this new pipe: it therefore became necessary to increase its hight to prevent water escaping from it—upon which it was continued to the top of the hospital, being twice the hight of the supplying cistern, but where, to the great surprise of those who constructed the work, some water still issued: a cistern was therefore placed to receive this water, which was found very convenient, since it was thus raised to the highest floors of the building without any extra labor. Here circumstances led the workmen to the construction of a water-ram without knowing that such a machine had been previously devised.

The first person who is known to have raised water by a ram, designed for the purpose was, Mr. Whitehurst, a watchmaker of Derby, in England. He erected a machine similar to the one represented by the next figure, in 1772. A description of it was forwarded by him to the Royal Society, and published in vol. lv. of their Transactions.



No. 167. Whitehurst's Water-Ram.

A represents the spring or reservoir, the surface of the water in which was of about the same level as the bottom of the cistern B. The main pipe from A to the cock at the end of C, was nearly six hundred feet in length, and one and a half inches bore. The cock was sixteen feet below A, and furnished water for the kitchen, offices, &c. When it was opened the liquid column in A C was put in motion, and acquired a velocity due to a fall of sixteen feet; and as soon as the cock was shut, the momentum of this long column opened the valve, upon which part of the water rushed into the air-vessel and up the vertical pipe into B. This effect took place every time the cock was used, and as water was drawn from it at short intervals for

household purposes, "from morning till night—all the days in the year" an abundance was raised into B, without any exertion or expense.

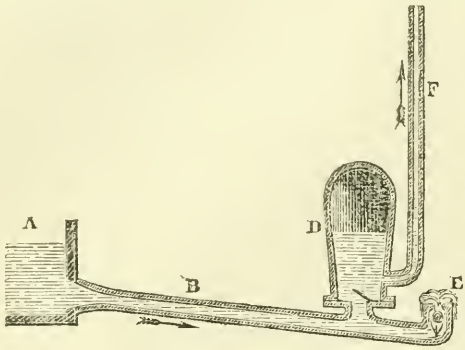
Such was the first water-ram. As an original device, it is highly honorable to the sagacity and ingenuity of its author; and the introduction of an air vessel, without which all apparatus of the kind could never be made durable, strengthens his claims upon our regard. In this machine he has shown that the mere act of drawing water from long tubes for ordinary purposes, may serve to raise a portion of their contents to a higher level; an object that does not appear to have been previously attempted, or even thought of. The device also exhibits another mode, besides that by pressure engines, of deriving motive force from liquids thus drawn, and consequently opens another way by which the immense power expended in raising water for supplying cities, may again be given out with the liquid from the lateral pipes. Notwithstanding the advantages derived from such an apparatus, under circumstances similar to those indicated by the figure, it does not appear to have elicited the attention of engineers, nor does Whitehurst himself seem to have been aware of its adaptation as a substitute for forcing pumps, in locations where the water drawn from the cock was not required, or could not be used. Had he pursued the subject, it is probable the idea of opening and closing the cock (by means of the water that escaped) with some such apparatus as that invented by Fluid, would have occurred to him and then his machine being made self-acting, would have been applicable in a thousand locations. But these additions were not made, and the consequence was, that the invention was neglected, and but for the one next to be described, it would most likely have passed into oblivion, like the steam machines of Branca, Kircher, and Decaus, till called forth by the application of the same principle in more recent devices.

Whenever we peruse accounts of the labors of ingenious men, in search of new discoveries in science or the arts, sympathy leads us to rejoice at their success and to grieve at their failure: like the readers of a well written novel who enter into the views, feelings and hopes of the hero; realize his disappointments, partake of his pleasures, and become interested in his fate: hence something like regret comes over us, when an industrious experimenter, led by his researches to the verge of an important discovery, is, by some circumstance, diverted (perhaps temporarily) from it; and a more fortunate or more sagacious rival steps in and bears off the prize from his grasp—a prize, which a few steps more would have put him in possession of. Thus Whitehurst with the water-ram, like Papin with the steam engine, discontinued his researches at the most interesting point—at the very turning of the tide that would have carried him to the goal; and hence the fruit of both their labors has contributed but to enhance the glory of their successors.

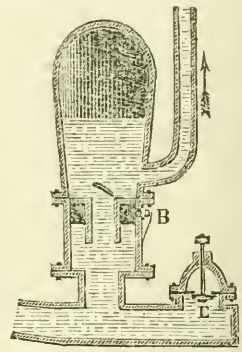
The *Bélier hydraulique* of Montgolfier was invented in 1796. (Its author was a French paper maker, and the same gentleman who, in conjunction with his brother, invented balloons in 1782.) Although it is on the principle of Whitehurst's machine, its invention is believed to have been entirely independent of the latter. But if it were even admitted that Montgolfier was acquainted with what Whitehurst had done, still he has, by his improvements, made the ram entirely his own. He found it a comparatively useless device, and he rendered it one of the most efficient—it was neglected or forgotten, and he not only revived it, but gave it a permanent place among hydraulic machines, and actually made it the most interesting of them all. It was, previous to his time, but an embryo; when, like another Prometheus, he not only wrought it into shape and beauty, but imparted to it, as it were, a principle of life, that rendered its movements *self-acting*; for it requires neither the attendance of man, nor any thing else, to keep it in play, but the momentum of the water it is employed to elevate. Like the organization of animal life, and the mechanism by which the blood circulates, the pulsations of this admirable machine incessantly continue day and night, for months and years; while nothing but deficiency of the liquid, or defects in the apparatus can induce it to stop.—It is, compared to Whitehurst's, what the steam-engine of Watt is to that of Savary or Newcomen.

Montgolfier positively denied having borrowed the idea from any one—he claimed the invention as wholly his own, and there is no reason whatever to question his veracity. The same discoveries have often been, and still are, made in the same and in distant countries, independently of each other. It is a common occurrence, and from the constitution of the human mind will always be one. A patent was taken out in England for self-acting rams in 1797 by Mr. Boulton, the partner of Watt, and as no reference was made in the specification to Montgolfier, many persons imagined them to be of English origin, a circumstance that elicited some remarks from their author. "Cette invention (says Montgolfier) n'est point d'origine Anglaise, elle appartient toute entière à la France; je déclare que j'en suis le seul inventeur, et que l'idée ne m'en a été fournie par personne; il est vrai qu'un de mes amis a fait passer, avec mon agrément, a MM. Watt et Boulton, copie de plusieurs dessins que j'avais faits de cette machine, avec un mémoire détaillé sur ses applications. Ce sont *ces mêmes dessins* qui ont été fidèlement copiés dans la patente prise par M. Boulton a Londres, en date du 13 Décembre 1797; ce qui est une vérité dont il est bien éloigné de disconvenier, ainsi que le respectable M. Watt." We have inserted this extract from Hachette, because we really supposed on reading the specification of Boulton's patent in the Repertory of Arts, (for 1798, vol. ix.) that the various modifications of the ram there described were the invention of that gentleman. The patent was granted to "Matthew Boulton, for *his* invention of improved apparatus and methods for raising water and other fluids."

No. 168 represents a simple form of Montgolfier's ram. The motive column descends from a spring or brook A through the pipe B, near the end of which an air chamber D, and rising main F, are attached to it as shown in the cut. At the extreme end of B, the orifice is opened and closed by a valve E, instead of the cock in No. 167. This valve opens downwards and may either be a spherical one as in No. 168, or a common spindle one as in No. 169. It is the play of this valve that renders the machine self-acting. To accomplish this, the valve is made of, or loaded with, such a weight as just to open when the water in B is at rest; *i. e.* it must be so heavy as to overcome the pressure against its under side when closed, as represented at



No. 168. Montgolfier's Ram.



No. 169. The same.

No. 169. Now suppose this valve open as in No. 168, the water flowing through B soon acquires an additional force that carries up the valve against its seat; then, as in shutting the cock of Whitehurst's machine, a portion of the water will enter and rise in F, the valve of the air chamber preventing its return. When this has taken place the water in B has been brought to rest, and as in that state its pressnre is insufficient to sustain the weight of the valve, E opens; (descends) the water in B is again put in motion, and again it closes E as before, when another portion is driven into the air vessel and pipe F; and thus the operation is continued, as long as the spring affords a sufficient supply and the apparatus remains in order.

The surface of the water in the spring or source should always be kept at the same elevation, so that its pressure against the valve E may always be uniform—otherwise the weight of E would have to be altered as the surface of the spring rose and fell.

This beautiful machine may be adapted to numerous locations in every country. When the perpendicular fall from the spring to the valve E is but a few feet, and the water is required to be raised to a considerable hight through F, then, the *length* of the ram or pipe B, must be increased, and to such an extent that the water in it is not forced back into the spring when E closes, which will always be the case if B is not of sufficient length. Mr. Millington, who erected several in England, justly observes that a very insignificant pressing column is capable of raising a very high ascending one, so that a sufficient fall of water may be obtained in almost every running brook, by damming the upper end to produce the reservoir, and carrying the pipe down the natural channel of the stream until a sufficient fall is obtained. In this way a ram has been made to raise one hundred hogsheads of water in twenty-four hours to a perpendicular hight of one hundred and thirty-four feet, by a fall of only four feet and a half.—M. Fischer of Schaffhausen, constructed a water-ram in the form of a beautiful antique altar, nearly in the style of that of Æsculapius, as represented in various engravings. A basin about six inches in depth, and from eighteen to twenty inches in diameter, received the water that formed the motive column. This water flowed through pipes three inches in diameter that descended in a spiral form into the base of the altar; on the valve opening a third of the water escaped, and the rest was forced up to a castle several hundred feet above the level of the Rhine.

A long tube laid along the edge of a rapid river, as the Niagara above the falls, or the Mississippi, might thus be used instead of pumps, water wheels, steam-engines and horses, to raise the water over the highest banks and supply inland towns, however elevated their location might be; and there is scarcely a farmer in the land but who might, in the absence of other sources, furnish his dwelling and barns with water in the same way, from a brook, creek, rivulet or pond.

If a ram of large dimensions, and made like No. 168, be used to raise water to a great elevation, it would be subject to an inconvenience that would soon destroy the beneficial effect of the air chamber. When speaking of the air vessels of fire-engines, in the third book, we observed that if air be subjected to great pressure in contact with water, it in time becomes incorporated with or absorbed by the latter.—As might be supposed, the same thing occurs in water-rams; as these when used are incessantly at work both day and night. To remedy this, Montgolfier ingeniously adapted a very small valve (opening inwards) to the pipe beneath the air chamber, and which was opened and shut by the ordinary action of the machine. Thus, when the flow of the water through B is suddenly stopped by the valve E, a partial vacuum is produced immediately below the air chamber by the recoil of the water, at which instant the small valve opens and a portion of air enters and supplies that which the water absorbs. Sometimes this *snifting* valve, as it has been named, is adapted to another chamber immediately below that which forms the reservoir of air, as at B in No. 169. In small rams a sufficient supply is found to enter at the valve E.

Although air chambers or vessels are not, strictly speaking, constituent elements of water-rams, they are indispensable to the permanent operation of these machines. Without them, the pipes would soon be ruptured by the violent concussion consequent on the sudden stoppage of the efflux of the motive column. They perform a similar part to that of the bags of wool, &c. which the ancients, when besieged, interposed between their walls and the battering rams of the besiegers, in order to break the force of the blows.

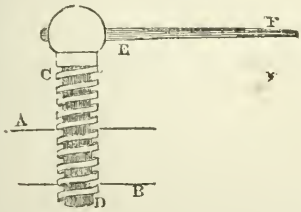
THE SCREW.

[From Dr. Dion. Lardner's Lectures, now in course of publication, by Greeley & McElrath.]

In the application of the screw, the weight or resistance is not, as in the inclined plane and wedge, placed upon the surface of the plane or thread. The power is usually transmitted by causing the screw to move in a concave cylinder, on the interior surface of which a spiral cavity is cut, corresponding exactly to the thread of the screw, and in which the thread will move by turning round the screw continually in the same direction. This hollow cylinder is usually called the *nut* or *concave screw*. The screw surrounded by its spiral thread is represented in fig. 8; and a section of the same playing in the nut is represented in fig. 9.

Fig. 8.

Fig. 9.



There are several ways in which the effect of the power may be conveyed to the resistance by this apparatus.

First, let us suppose that the nut A B is fixed. If the screw be continually turned on its axis, by a lever E F inserted in one end of it, it will be moved in the direction C D, advancing every revolution through a space equal to the distance between two contiguous threads. By turning the lever in an opposite direction, the screw will be moved in the direction D C.

If the screw be fixed, so as to be incapable either of moving longitudinally or revolving on its axis, the nut A B may be turned upon the screw by a lever, and will move on the screw toward C or toward D, according to the direction in which the lever is turned.

In the former case, we have supposed the nut to be absolutely immovable; and, in the latter case, the screw to be absolutely immovable. It may happen, however, that the nut, though capable of revolving, is incapable of moving longitudinally; and that the screw, though incapable of revolving, is capable of moving longitudinally. In that case, by turning the nut A B upon the screw by the lever, the screw will be urged in the direction C D or D C, according to the way in which the nut is turned.

The apparatus may, on the contrary, be so arranged that the nut, though incapable of revolving, is capable of moving longitudinally; and the screw, though capable of revolving, is incapable of moving longitudinally. In this case, by turning the screw in the one direction, or in the other, the nut A B will be urged in the direction C D or D C.

All these various arrangements may be observed in different applications to the machine.

A screw may be cut upon a cylinder by placing the cylinder in a turning-lathe, and giving it a rotatory motion upon its axis. The cutting point is then presented to the cylinder, and moved in the direction of its length, at such a rate as to be carried through the distance between the intended thread, while the cylinder revolves once. The relative motions of the cutting point and the cylinder being preserved, with perfect uniformity, the thread will be cut from one end to the other. The shape of the threads may be either square, as in fig. 8, or triangular, as in fig. 10.

The screw is generally used in cases where severe pressure is to be excited through small spaces; it is, therefore, the agent in most presses. In fig. 11, the nut is fixed, and by turning the lever, which passes through the head of the screw, a pressure is excited upon any substance placed upon the plate immediately under the end of the screw.—In fig. 12, the screw is incapable of revolving, but is capable of advancing in the direction of its length. On the other hand, the nut is capable of revolving, but does not advance in the direction of the screw.—When the nut is turned by means of the screw inserted in it, the screw advances in the direction of its length, and urges the board which is attached to it upward, so as to press any substance placed between it and the fixed board above.

Fig. 10.

Fig. 11.

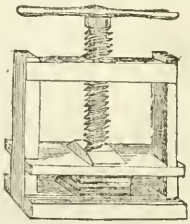
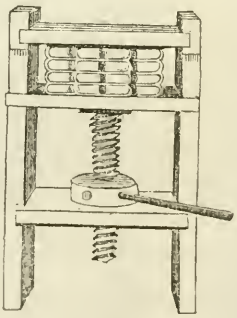


Fig. 12.



In cases where liquids or juices are to be expressed from solid bodies, the screw is the agent generally employed. It is also used in coining, where the impression of a die is to be made upon a piece of metal, and in the same way in producing the impression of a seal upon wax or other substance adapted to receive it. When soft and light materials, such as cotton, are to

be reduced to a convenient bulk for transportation. the screw is used to compress them. and they are thus reduced into hard. dense masses. In printing. formerly. the paper was urged by a severe and sudden pressure upon the types by means of a screw.

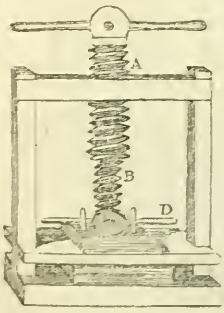
As the mechanical power of the screw depends upon the relative magnitude of the circumference through which the power revolves. and the distance between the threads. it is evident. that to increase the efficacy of the machine. we must either increase the length of the lever by which the power acts. or diminish the magnitude of the thread. Although there is no limit in theory to the increase of the mechanical efficacy by these means. yet practical inconvenience arises which effectually prevents that increase being carried beyond a certain extent. If the lever by which the power acts be increased. the same difficulty arises as was already explained in the wheel and axle: the space through which the power should act would be so unwieldy. that its application would become impracticable. If. on the other hand. the power of the machine be increased by diminishing the size of the thread. the strength of the thread will be so diminished. that a slight resistance will tear it from the cylinder. The cases in which it is necessary to increase the power of the machine being those in which the greatest resistances are to be overcome. the object will evidently be defeated if the means chosen to increase that power deprive the machine of the strength which is necessary to sustain the force to which it is to be submitted.

These inconveniences are removed by a contrivance of Mr. Hunter. which. while it gives to the machine all the requisite strength and compactness. allows it to have an almost unlimited degree of mechanical efficacy.

This contrivance consists in the use of two screws. the threads of which may have any strength and magnitude. but which have a very small difference of breadth. While the working point is urged forward by that which has the greater thread. it is drawn back by that which has the less; so that. during each revolution of the screw. instead of being advanced through a space equal to the magnitude of either of the threads. it moves through a space equal to their difference. The mechanical power of such a machine will be the same as that of a single screw. having a thread whose magnitude is equal to the difference of the magnitudes of the two threads just mentioned.

Thus, without inconveniently increasing the sweep of the power, on the one hand, or on the other. diminishing the thread until the necessary strength is lost, the machine will acquire an efficacy limited by nothing but the smallness of the difference between the two threads.

Fig. 13.



This principle was first applied in the manner represented in fig. 13. A is the greater thread. playing in the fixed nut; B is the lesser thread, cut upon a smaller cylinder. and playing in a concave screw, cut within the greater cylinder. During every revolution of the screw. the cylinder A descends through a space equal to the distance between its threads. At the same time. the smaller cylinder B ascends through a space equal to the distance between the threads cut upon it: the effect is, that the board D descends through a space equal to the difference between the threads upon A and the threads upon B, and the machine has a power proportionate to the smallness of this difference.

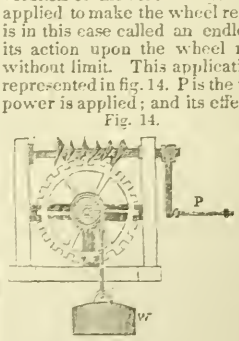
Thus. suppose the screw A has twenty threads in an inch. while the screw B has twenty-one: during one revolution. the screw A will descend through a space equal to the twentieth part of an inch. If, during this motion. the screw B did not turn within A, the board D would be advanced through the twentieth of an inch; but because the hollow screw within A turns upon B, the screw B will, relatively to A. be raised in one revolution through a space equal to the twenty-first part of an inch. Thus, while the board D is depressed through the twentieth of an inch by the screw A. it is raised through the twenty-first of an inch by the screw B. It is, therefore, on the whole, depressed through a space equal to the excess of the twentieth of an inch above the twenty-first of an inch—that is, through the four hundred and twentieth of an inch.

The power of this machine will, therefore. be expressed by the number of times the four hundred and twentieth of an inch is contained in the circumference through which the power moves.

In the practical application of this principle at present, the arrangement is somewhat different. The two threads are usually cut on different parts of the same cylinder. If nuts be supposed to be placed upon these, which are capable of moving in the direction of the length. but not of revolving. it is evident that by turning the screw once round, each nut will be advanced through a space equal to the breadth of the respective threads. By this means the two nuts will either approach each other. or mutually recede, according to the direction in which the screw is turned, through a space equal to the difference of the breadth of the threads, and they will exert a force either in compressing or extending any substance placed between them. proportionate to the smallness of that difference.

A toothed wheel is sometimes used instead of a nut, so that the same quality by which the revolution of the screw urges the nut forward is applied to make the wheel revolve. The screw is in this case called an endless screw. because its action upon the wheel may be continued without limit. This application of the screw is represented in fig. 14. P is the winch to which the power is applied; and its effect at the circumference of the wheel is estimated in the same manner as the effect of the screw upon the nut.—This effect is to be considered as a power acting upon the circumference of the wheel; and its proportion to the weight or resistance is to be calculated in the

Fig. 14.



same manner as the proportion of the power to the weight in the wheel and axle.

We have hitherto considered the screw as an engine used to overcome great resistances. It is also eminently useful in several departments of experimental science, for the measurement of very minute motions and spaces, the magnitude of which could scarcely be ascertained by any other means. The very slow motion which may be imparted to the end of a screw, by a very considerable motion in the power, renders it peculiarly well adapted for this purpose. To explain the manner in which it is applied—suppose a screw to be so cut as to have fifty threads in an inch, each revolution of the screw will advance its point through the fiftieth part of an inch. Now, suppose the head of the screw to be a circle, whose diameter is an inch, the circumference of the head will be something more than three inches; this may be easily divided into a hundred equal parts distinctly visible. If a fixed index be presented to this graduated circumference, the hundredth part of a revolution of the screw may be observed, by noting the passage of one division of the head under the index. Since one entire revolution of the head moves the point through the fiftieth of an inch, one division will correspond to the five thousandth of an inch. In order to observe the motion of the point of the screw in this case, a fine wire is attached to it, which is carried across the field of view of a powerful microscope, by which the motion is so magnified as to be distinctly perceptible.

A screw used for such purposes is called a *micrometer screw*. Such an apparatus is usually attached to the limbs of graduated instruments, for the purpose of astronomical and other observation. Without the aid of this apparatus, no observation could be taken with greater accuracy than the amount of the smallest division upon the limb. Thus, if an instrument for measuring angles were divided into small arches of one minute, and an angle were observed which brought the index of the instrument to some point between two divisions, we could only conclude that the observed angle must consist of a certain number of degrees and minutes, together with an additional number of seconds, which would be unknown, inasmuch as there would be no means of ascertaining the fraction of a minute between the index and the adjacent division of the instrument. But if a screw be provided, the point of which moves through a space equal to one division of the instrument, with sixty revolutions of the head, and the head itself be divided into one hundred equal parts, each complete revolution of the screw will correspond to the sixtieth part of a minute, or to one second, and each division on the head of the screw will correspond to the hundredth part of a second. The index being attached to this screw, let the head be turned until the index be moved from its observed position to the adjacent division of the limb. The number of complete revolutions of the screw necessary to accomplish this will be the number of seconds; and the number of parts of a revolution over the complete number of revolutions will be the hundredth parts of a second necessary to be added to the degrees and minutes primarily observed.

It is not, however, only to angular instruments that the micrometer screw is applicable; any spaces whatever may be measured by it. An instance of its mechanical application may be mentioned in a steel-yard, an instrument for ascertaining the amount of weights by a given weight, sliding on a long graduated arm of a lever. The distance from the fulcrum, at which this weight counterpoises the weight to be ascertained, serves as a measure to the amount of that weight. When the sliding weight happens to be placed between two divisions of the arm, a micrometer screw is used to ascertain the fraction of the division.

Hunter's screw, already described, seems to be well adapted to micrometrical purposes, since the motion of the point may be rendered indefinitely slow without requiring an exquisitely fine thread, such as in the single screw would in this case be necessary.

COMPARATIVE VALUE OF DIFFERENT KINDS OF FODDER.—The following table is the result of experiments made by the principal agriculturists of the continent, and published by M. Antoine at Nancy. The best upland meadow hay is taken as the standard, at 100 lbs., and the specified weight of the other kinds of fodder enumerated are required to produce the same results:

Good hay	lbs. 100
Aftermath hay	102
Clover hay, made when the blossom is completely developed	90
Ditto, before the blossom expands	88
Clover, second crop	98
Lucerne hay	98
Sainfoin hay	89
Tare hay	91
Spergula arvensis, dried	90
Clover hay, after the seed	145
Green Indian corn	275
Vetches or tares, green	420
Green clover	457
Green spergula	485
Stems and leaves of Jerusalem artichokes	985
Cow-cabbage leaves	541
Beet-root leaves	900
Potato haulm	300
Rye straw	442
Oat straw	[illegible]
Peas haulm	153
Vetch haulm	150
Bean haulm	140
Buckwheat straw	185
Dried stalks of Jerusalem artichokes	170
Dried stalks of Indian corn	400
Millet straw	250
Raw potatoes	201
Boiled ditto	175
White Silesian beet	220
Mangel-wurzel	539
Turnips	364
Carrots	276
Swedish Turnips	308
Ditto, with leaves on	360
Grain—Rye	54
Wheat	42
Barley	54
Oats	59
Vetches	30
Peas	45
Beans	45
Buckwheat	64
Indian corn	57
Linseed cake	69
Wheat bran	136
Rye bran	109
Wheat, peas and oat chaff	167
Rye and barley chaff	179

EXPERIMENTS WITH MANURES.

BY ROBERT MONTEITH, ESQ. OF CARSTAIRS.

1. Oat Crop, 1843.—Part of a field manured with 267 lbs. of guano, at the cost of 31s. per imperial acre, produced per acre.....59 bushels.

Manured with 10 bushels bone-dust, at the cost of 23s. 4d. per imperial acre, produced per acre.....43 do.

The difference may be stated as follows:

Cost of guano 31s. produce 59 bush. at 2s. 6d.	£7	7	6
Cost of bones 23s. 4d. do. 43 do. do.	5	7	6
7s. 8d.	£2	0	0
Deduct difference of manure.....	0	7	8
Leaving in favor of Guano	£1	12	4

2. Hay Crop, 1843.—To part of a field, manured the previous year with farm-yard dung, was given 267 lbs. of guano per imperial acre, at the cost of 31s. and the *extra produce*, per acre, was 22 cwt. of hay, which, at 3s. per cwt. is £3 6 0

Deduct expense of guano 1 11 0

Leaving in favor of guano £1 15 0 per acre.

3. With Turnip, 1843.

No.	Quantity of land tried	Description of manure tried, and quantity per imperial acre.		Cost of Dung pr acre			Cost of other Manures per acre.			Total cost per acre.			Produce per imperial acre stored Nov. 15, 1843.	
	Acre.			£	s.	d.	£	s.	d.	£	s.	d.	Tons.	Cwt.
1	¼		Guano 4 cwt.....				2	8	0	2	8	0	11	8
		Yds.												
2	½	Dung 28	Sulphate of Soda, 1 cwt.....	5	12	0	0	4	0	5	16	0	9	8
3	½	" 28	Burned Bones, 6 cwt.....	5	12	0	2	2	0	7	14	0	7	11
4	½	" 28	Bone-dust, 20 bushels.....	5	12	0	2	6	8	7	18	8	7	2
5	½	" 28		5	12	0				5	12	0	4	19
6	½	" 28	Gypsum, 2½ cwt.....	5	12	0	0	8	9	6	0	9	6	1
7	¼	" 28	Guano, 4 cwt.	5	12	0	2	8	0	8	0	0	7	13
8	1-16	" 28	Beech-ashes, 48 bushels	5	12	0	0	12	0	6	4	0	5	12
9	1-16		Gypsum, 6 cwt.....				1	1	0	1	1	0	a failure.	
10	1		Bone-dust, 25 bushels				4	3	4	4	3	4	9	6
11	1		Do. 12 bushels, and 133 lbs. guano				2	14	3	2	14	3	11	15
12	1		Guano, 356 lbs				1	18	2	1	18	2	11	0
13	1		Guano, 267 lbs.....				1	8	7	1	8	7	10	15

November 30, 1843.—The turnip crop on the field in which the above experiments were tried was fully one-third deficient in quantity from crops generally grown on such land in this part of the country, the soil being heavy and under medium quality. All the turnip crops in this neighborhood are, however, from one-third to one-half deficient this season.

Expense of Keeping Horses.—In a late English Monthly Magazine, there is an elaborate essay on the winter and summer keeping of Farm Horses. Though the whole of it is interesting to read, the articles of food, brought into the comparison, are so different from those in use in our country, that it would not do to give up the space that the whole essay would occupy. But look here at the conclusion to which the writer arrives:

Thus then, it is seen that the cost of keeping each horse upon a farm of 120 imperial acres of heavy land, all under crop, is about £8 9s. 5d. during the five summer months, and £12 12s. 2¼d. for the seven winter months, or in all £21 11s. 7¼d. being a saving of £2 2s. 2½d. in favor of bean straw and boiled mashes as compared to hay and hard corn, for the winter; and a saving of £2 8s. 9d. in the case of posting horses for a period of six months; or a clear gain of £18 9s. 8¼d. to the farmer on the winter keeping of nine horses, and of £131 12s. 6d. to the postmaster on fifty-four horses during the winter—no small matter in these times, taken in connection with the positively improved condition of both classes of horses, and the regular performance of ordinary work in both cases. Otherwise the comparative saving would be of little avail, were the horses not at the same time found equal, and more than equal, to their ordinary work; for *no greater error can be committed by any farmer than to allow his horses to fall off for want of nutritious provender, especially in winter, with the prospect of long days of severe spring labor before them.*

COMPARATIVE VIEWS OF THE PROGRESS OF POPULATION IN CERTAIN REGIONS OF THE UNITED STATES:

WITH REMARKS....BY WILLIAM DARBY.

WASHINGTON, 10th Nov. 1845.

JOHN S. SKINNER, Esq.

Dear Sir—The monthly reception of your "LIBRARY" affords me the double pleasure of hearing from you by your valuable labors, and of finding by their means that Agriculture is becoming, in our country, a science. I rejoice still more to see elements collected which, when published in so attractive a form as the Library, must have great effect on the far too prevalent emigration from the Atlantic region of the United States into the interior and Western sections of North America.

You cannot, as you know my sentiments on the subject, but many others may suppose, from my frequent essays on the rapid increase and dispersion of our population over the continent, that I was an advocate for that course of things. In those essays I have spread before the public data on what neither myself or any one else can control—stated facts as they presented themselves, as inevitable consequences.

In advance of the matter enclosed, let me observe that I principally value such works as the "LIBRARY" from their tendency to demonstrate false views, which lead so many to sacrifice advantages already within their reach, for speculative hopes, distant in space and time—hopes never, by any possibility, realized, except in very rare instances.

Few persons are aware of the peculiar advantages of the Atlantic slope of North America. If we extend our views into a not very distant futurity, when the central part of the Continent will teem with inhabitants, the Atlantic border will stand as the gateway between the great civilized nations of the Eastern and Western Continents. In some very essential respects, such is the case at present.

As population is the first, the last, and principal consideration on all statistical subjects, I have constructed the enclosed tabular, to serve as comparative data, as regards those parts of the Atlantic border where the facilities of commercial and agricultural, as well as manufacturing prosperity abound, and yet have remained stationary, or retrograde, whilst other parts, in no essential respect differing in natural advantages, have advanced in wealth and power.

It must be obvious that in these views I can have no sectional or other partial bias. My desire is to show, from actual experience, that there must exist either some inherent cause of discontent, or most alluring prospects of gain, to induce the people of the Atlantic border to abandon their place of birth, and cut asunder so many ties, so many domestic associations—and that to an extent not only to prevent increase, but to produce a diminution, of physical, intellectual, and moral power. Were we made acquainted with such a fact, founded on official data, in the political history of any monarchical State of Europe, we would at once set it down as a proof of the deteriorating effects of that form of government.

In the case for our consideration, now before us, and applied to a region most favored by every facility to derive benefit from human labor, where Nature itself has scooped many of the finest havens of the globe—havens on which cities have already risen, in a comparatively short period, vying with the great marts of Europe and Asia; such a country, also abounding in means of religious, moral and intellectual culture; what are the inducements offered by western or central settlements, to compensate for the sacrifice of so many advantages, already at command, on the Atlantic border? Land! more land! Does any one suppose that the expense of removal and obtaining new residences will not be as great, and the success more precarious as to resulting profit, than the same time, means, and labor, applied to the improvement of soil already possessed?

On such a subject, yourself and readers will pardon the introduction of a moment's allusion to my own experience, and also the confident tone of my remarks. I was removed into the interior when very young, but old enough to remember much consequent hardship felt and witnessed. It is true that many of the difficulties to which emigrants of more than half a century past were exposed are now removed or greatly mitigated; yet I have no hesitation to

say that, as a rule admitting very few exceptions, the first generation of emigrants are worn away with labor and care, and with no small share of regret, before the second can be placed in as happy homes as were left for shadowy hopes. Were the Atlantic border of the United States, like the Pacific border of China, teeming with an overcharged population, relief would be naturally and rationally sought, by removal to a wilderness, or thinly peopled region, with a productive soil and temperate climate, did such offer; but, from spaces where the maximum of distributive population falls far short of fifty to the square mile, and where two hundred on equal surface could find support, with the enjoyment of every comfort of life, there must exist some great defect in modes of thinking to superinduce extensive emigration.

In the selection of element for the following comparative tables, I have not included either Maine or New-York, as causes peculiar to both these States have influenced their political history. The sections adopted have been comparatively less influenced by external causes than most other parts of the United States, and, as to soil, have in themselves much in common.—They have all, in a peculiar degree, the advantages of commercial facilities, but those southward of New-York in a much greater extent than those to the northward. The period chosen of thirty years, from 1810 to 1840, was, perhaps, of any portion of time since the English Colonies were originally formed in North America, the one best calculated to illustrate the philosophy of our statistical history.

TABLE I. *Table of the Progressive Population of the Five States named, from* 1810 *to* 1840, *as deduced from the respective Census Returns of those years.*

STATES.	Population, 1810.	Population, 1840.	Area in sqr. miles.	Population to the sqr. mile, 1840.	Ratio of increase in 30 years.
Vermont	217,713	291,948	10,212	28	1·34
New-Hampshire	214,360	284,574	9,280	30	1·33
Massachusetts	472,040	737,699	7,800	94	1·56
Connecticut	262,042	309,978	4,674	66	1·18
Rhode Island	77,031	108,830	1,360	80	1·4
Amount	1,243,216	1,733,029	33,326	52	1·31

TABLE II. *Table of the Progressive Population of the Lower or Maritime Counties of New-Jersey, Pennsylvania, Maryland, and the whole three Counties of Delaware, from* 1810 *to* 1840.

COUNTIES.		Population, 1810.	Population, 1840.	Area in sq. miles	Population to the sqr. mile, 1840.	Ratio of increase in 30 years.
NEW-JERSEY	Cape May	3,632	5,344	310	17	1·47
	Cumberland	12,640	14,374	450	32	1·13
	Salem	12,761	16,024	300	53	1·25
PENNSYLVANIA	Chester	39,596	57,513	732	54	1·45
	Delaware	14,734	19,791	220	nearly 90	1·34
DELAWARE	Newcastle	24,429	33,120	456	72	1·35
	Kent	20,495	19,872	640	30	3 per cent.
	Sussex	28,540	25,093	875	28	11 do.
MARYLAND	Caroline	9,453	7,806	240	32	17½ do.
	Cecil	13,066	17,222	264	65	1·31
	Dorchester	18,108	18,843	640	29	1·04
	Kent	11,450	10,842	240	77	10 per cent.
	Queen Ann	16,648	12,633	400	31	24 do.
	Somerset	17,579	19,508	540	36	1·11
	Talbot	14,157	12,090	200	60	15 per cent.
	Worcester	16,971	18,377	700	26	1·08
Amount		274,299	308,442	8,207	37	1·124

With similar views which induced me to construct the foregoing tables, I drew up a rough table of that part of Virginia east of the Blue Ridge, and intended to copy it for your use; but, finding it divided into sixty-five counties, some of which had been, from 1810 to 1840, divided, I considered it more satisfactory to present the whole in one point of view. That part of Virginia has a rather remarkable approach to a triangle, having two hundred and sixty miles along the Blue Ridge—a very near equal distance on North-Carolina—and, in direct distance, about two hundred and twenty from the south-eastern angle on the Atlantic Ocean to the northern at the mouth of the Shenandoah: area about 27,000 square miles.

On this space, in 1810, by the census returns of that year, there existed a population of 705,196; which mass had, in the ensuing thirty years, augmented to 800,036, or increased by slow ratio of 1·134. Many of the counties remained nearly stationary, while some, similar to several in Table II., had diminished in population.

TABLE III. *Summary of Tables I. and II.*

Tables.	Population, 1810.	Population, 1840.	Area in square miles.	Population to the sqr. mile, 1840.	Ratio of increase in 30 years.
Table I.	1,243,216	1.733,029	33,326	52	1·39
Table II.	274,299	308,442	8,207	37	1·124
Amount	1,517,515	2,041,471	41,523	49	1·345

TABLE IV. *Elements of Table II. combined with those of Eastern Virginia.*

	Population, 1810.	Population, 1840.	Area in square miles.	Population to the sqr. mile, 1840.	Ratio of increase in 30 years.
Table II.	274,299	308,442	8,207	37	1·124
Eastern Virginia	705,196	800,036	27,000	33 7-10	1·134
Amount	979,495	1,108,478	35,207	31 4-10	1·131

The two right-hand columns of these tables afford lessons which ought to excite serious reflections on our domestic policy. To stay the current of Western emigration is a hopeless prospect, but many may be restrained from casting themselves on the current by timely warning. Let any person open a map of the United States, and scan the surface embraced by all the tabular views here presented, and then, with an Atlas of the World before him, find, if he can, a single other space on Earth, all things considered, superior. I have not, for obvious reasons, included lower New-York and the more populous maritime counties of New-Jersey; but may observe that no other principle in statistics is more sure in application than that great cities contribute to make great counties around them. That districts in their vicinity should not only remain, as to population, stationary, but some of them have a diminishing ratio, while were rising such cities as New-York, Philadelphia, Wilmington and Baltimore, must arise from some sinister cause. Let us pause a moment, and examine the general progress of the entire population of the United States, during the Thirty Years' Period, from 1810 to 1840.

TABLE V. *Tabular View of the Progressive Population of the whole States and Territories of the United States, which were embraced by both enumerations.*

STATES.	Population, 1810.	Population, 1840.	Area in sqr. miles.	Population to the sqr. mile, 1840.	Ratio of increase in 30 years.
Maine	228,705	501,793	33,000	15·2	2·19
New-Hampshire	214,360	284,574	9,280	30	1·33
Vermont	217,713	291,948	10,212	28	1·34
Massachusetts	472,040	737,699	7,800	94	1·56
Rhode Island	77,031	108,830	1,360	80	1·40
Connecticut	262,042	309,878	4,674	66	1·18
New-York	959,949	2,428,921	46,000	52·7	2·53
New-Jersey	249,555	373,303	6,900	54	1·49
Pennsylvania	810,091	1,724,033	43,950	41·4	2·12
Delaware	72,674	78,085	2,068	37·7	1·07 4-10
Maryland	380,546	470,019	10,800	43	1·23
Virginia	974,642	1,239,797	64,000	19·3	1·23
North-Carolina	555,500	753,419	43,800	17·2	1·35
South-Carolina	415,115	594,398	30,000	19·8	1·37
Georgia	252,433	691,392	58,200	12	2·34
Alabama	20,845	590,756	50,000	11·8	2·74
Mississippi	40,352	375,651	45,350	8·2	9·30
Louisiana	76,556	352,411	48,220	7·5	4·60
Tennessee	261,727	829,210	40,000	20	3·13
Kentucky	406,511	779,828	39,000	20	1·90
Ohio	230,760	1,519,467	39,000	40	6·58
Michigan	4,762	212,267	54,000	40	44·6
Indiana	24,520	685,866	36,250	19	27·9
Illinois	12,282	476,183	59,000	8	38·9
Missouri	20,845	383,702	60,300	19	18·4
Columbia	24,023	43,712	100		1·81
Amount	7,239,814	16,837,285	827,264	20½	2·32

The figures in Table V. speak, in strong language, the peculiar diffusion of population—the immense void to fill up in the already organized States—and the highly important fact that while, in 1840, several of the central States nearly doubled the mean population of the Union, as many of the old Atlantic States fell short of the mean of the whole.

In such estimates, we may premise that positive accuracy cannot be attained, and ought not to be expected. It is, however, of very minor consequence that minute details do not present mathematical precision, while the general results cannot be disputed. If no change takes place in the current of emigration, the centre of political power must correspond with the centre of force, and leave at long distance the Atlantic coast.

ON THE IMPORTANCE OF DRAINING LAND.

We remember well the time when the idea of fertility and heavy products was so intimately and thoroughly blended with that of *moisture*, that wherever we saw a piece of land that was constantly *moist*, so that no water laid on its surface, we set down *that spot* as one that would not fail to bring a heavy crop—especially of grass; and we have our doubts whether there was not a time when this was the common impression. Inquiry, reflection and experience are, however, now doing for Agriculture what they have sooner done for other pursuits; and now, fortunately, the *mind is brought to work at every turn*, and empiricism and prejudice are made to give way before investigation and proof. Now the Farmer is taught by the exercise of his reason, and, even without knowing it, by the principles of agricultural chemistry, that a *settled, abiding moisture* in land, resulting from some obstruction to the escape of water, either rain or spring water, is incompatible with that degree of *warmth* which is one of the indispensable conditions to the development and growth of vegetables. Hence, as the Farmer who walks or rides over his estate, and sees a sunken or a low spot, which in the driest weather shows signs of *constant* dampness, indicated by coarse aquatic grasses, or otherwise, he says to himself, 'There is a portion of my capital lying dead and inert. I must therefore contrive so to *drain it* that the water will not *settle* upon or in it, and thus give it life and activity. Then I shall have removed the only obstacle which prevents it from yielding a heavier crop either of *grain* or grass, than any other equal portion of my estate;'—for the Farmer ought to lay it down as a rule, that even where he proposes to lay down his land in grass, it should yet be so well drained as to be well adapted to the growth of *grain*. Land so laid dry, will always give, with equal richness, a better crop of cleaner and more valuable *hay*, than that which is too wet to produce grain. Let him who wants to see heavy crops of clean, nutritious timothy hay, go to the naturally dry, hilly lands, such as George Patterson's, Gov. Howard's, or N. Bosley's, on the Gunpowder, in Maryland. True, there are many fields that are well adapted to the growth, and produce *heavy crops*, of tobacco or grain, that would not yield, and at all events not more than one crop, of timothy, or herd's grass, as it is called in different parts of the country; but that is owing, not to the absence of moisture, but to some other condition of the land—to too much of one and too little of another kind of soil, and to other circumstances, not to the want of moisture. Moisture, it is undeniable, is essential to the growth of all vegetables, according to the laws of vegetable physiology, but not fixed, pent-up moisture. Its departure, like its coming, should be free and natural. If we appear to dwell too much on this subject (of draining), it is because it is impossible to pass along through the country without being struck with the quantity of land, on almost every estate, the very best land on it, which is made sick and unproductive of all wholesome growths, by circumstances that *prevent the escape of redundant moisture;* and it is among the foremost of our wishes, to see the minds of land-holders possessed of the conviction that it is idle to be sighing and scheming for more land, or repining at the inadequacy of their income, while they have already so many acres that lie waste and unproductive—paying interest but yielding no dividend, for want of draining, grubbing, cleaning and manuring.

At a late meeting of the Scotch Highland Society, at Dumfries, an interesting discussion took place on Draining as "among the foremost" of the means for agricultural improvement. The particular testimony to which we would invite the attention of the reader is that of Mr. Elliot:

Prof. Johnston said—I am quite sure that the general statements which Mr. Elliot has made must have produced an impression upon the meeting. At the same time I know the farmers so well, that I am sure nothing will so much satisfy them, or the landlords either, as showing that the proposed improvement will put money in their pockets (hear, hear). Now Mr. Elliot has drained largely, and I know successfully (applause): you will excuse me, therefore, if I ask what are the results of his own draining? He is one of the most enterprising drainers in Dumfriesshire, and is, therefore, a noble example. I should like him to let the strangers here know what are the results during the eight years which he has been employed in draining? I would ask first, what have been the general results of draining on the whole farm?—how much has it increased the produce?

Mr. Elliot said—I have a statement which shows the improvement. Before, my land was partly wet and partly dry; one-half, nearly, has not been drained; but the principal improvement on the whole has been by draining. The result I will read to you:

PRODUCE OF THE OAT CROP ON THE FARM.

1st year,	1837	4·4	after one sown.
2d "	1838	5·6	"
3d "	1839	6·5	"
4th "	1840	6·8	"
5th "	1841	8·4	"
6th "	1842	7·6	"
7th "	1843	8·5	"
8th "	1844	8·3	"

BARLEY CROP.

1st year	8·2	after one sown; a small quantity this year sown on a piece of the best land.
2d "	5·4	after one.
3d "	6·2	"
4th "	10·2	"
5th "	10·1	"
6th "	11·7	"
7th "	10·5	"
8th "	11·8	"

Thus showing that I realized by draining an increase of more than double the original produce (Applause).

Professor Johnston.—It appears from Mr. Elliot's statement that he has doubled the produce of oats and barley in eight years. Now I know he can give us farther information. The second question I would ask is this: he has stated that if the whole farm was drained, it would have produced a greater increase. Now, can Mr. Elliot give us the detailed result of one part of the farm—what it was worth when he began, and what it is worth now?

Mr. Elliot.—One moor I drained which every one who knew it declared to be perfectly useless. It was not worth 2s. an acre. There were ninety-one acres of it; and one gentleman present who observed it told me that it never could be improved. I drained it, however, at an expense of nearly £600. A great part of it was covered with water-lilies, rushes, whins, heather, and gall-roots; but the first year, after liming and fallowing, it yielded 3,500 bushels, nearly 40 bushels to the acre (*Applause*). The second crop was equal. This year I have a crop of oats, after turnips, upon 12 acres of it, yielding 46 bushels to the acre; of potatoes I had a heavy crop, and of turnips also a good one (*Applause*). Another moor of 43 acres I drained at an expense of nearly £300. The first crop, after fallowing and lime, gave 42 bushels an acre. This was upon land that was previously not worth 2s. an acre (*Loud applause.*)

In answer to a question from the Chairman, Mr. Elliot said his land was situated at an elevation of about two hundred feet above the level of the sea.

Professor Johnston explained, in answer to a question sent in to him, that four and three-tenths, and so on, occurring in Mr. Elliot's speech, meant that one seed gave four and three-tenths—that where he had only four once, he now got eight seeds off the same land.

By the bye, does it occur to the farmer, that when by *draining*, he doubles the produce of an acre, he doubles the value of his land? that it is far better than getting an additional acre of the same value—because, it takes only *half the labor* to cultivate one acre that it does to cultivate two, and yet he arrives at the same result as to the quantity of produce—in other words, reaps an equal reward, at half the expense? An acre of naturally fertile land rendered unproductive by superfluous moisture, and the crop of which is doubled by draining, is more profitable than an acre the produce of which is doubled by manuring—because, although the process of draining in the first instance, may be more expensive than that of manuring an acre of poor dry land, yet the manured land will be much sooner exhausted and reduced again to unproductiveness, than that sort of land which usually requires draining. Besides, it is absolutely disreputable for a farmer to have on his estate at every turn, these valuable spots—sometimes one acre—sometimes more, sometimes less—which ask only to be drained to give him the most valuable return for his labor; but which in the condition they are left, throw up worthless or unwholesome grasses, exhale malaria, generate rot among his sheep, and fevers in his family. A friend of ours once observed. "Sir, when I go to see a gentleman farmer, if he does not invite me to ride over his estate and look at his crops, I always suspect it is because it is full of gullies and bogs, and naked and miry spots!"

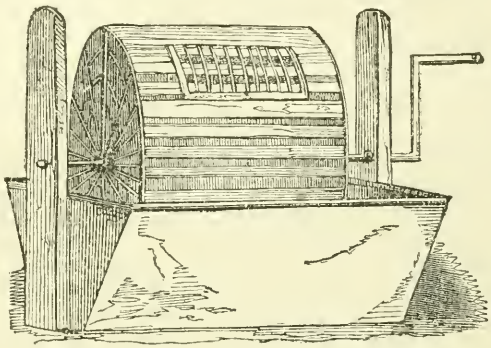
True, it may be answered that draining is very expensive; and so it is, on a large scale and under many circumstances; but this, with many, is a mere pretext for procrastination and want of enterprise. It might often be effected, as by Mr. SOMERS, a plain farmer below Nottingham, in Maryland, by cutting a common ditch, and in the bottom of it laying two poles, side by side, covering these with cedar brush carefully laid down, and then with sods and dirt, and plowing and sowing over the whole. The increased crop in a single year would pay the expense, besides leaving the land, as in his case, worth $20 or $30 an acre for ever after, instead of being a *quagmire*. Who has not remarked that indolence has a very inventive genius of its own when it seeks to excuse itself for its inactivity and love of repose?

POTATO WASHER.

WE are not aware that the machine or utensil, described below, is generally known, though we are sure it ought to be in general use where any considerable number of potatoes are raised, more especially where they are cultivated for feeding stock. The first we ever saw was brought from Scotland, and the only one except one that we got him to have made after it, and was in use, by Mr. BEVAN, manager for the late estimable R. CATON, Esq., of "*Brookland-Wood*," near Baltimore: a gentleman of uncommon amiability and various knowledge—one who possessed a thousand times more of a spirit to be useful to the country and his fellow men, than many who derided his enthusiasm, without emulating the generous impulses in which it was founded and the useful purposes to which it would have prompted him.

This potato washer is one of the most labor saving contrivances we have seen in operation. True, it seems to be a small affair, but every thing that saves a minute is important in a country like ours, where, above all others, labor is high and "*time is money.*"

The annexed sketch of a machine for washing potatoes, which is used in Nottinghamshire, may be acceptable to some of your readers. It is easily made by any village workman, and will be found very effectual. It is simply a churn-like cylinder, with open bars placed at such a distance as to prevent any of the potatoes from falling through, except very small ones, the lower part of which as it revolves, passes through a trough of water.



It may be made to be easily unshipped, like a churn, or fixed more permanently, as in the sketch. Where many potatoes are used, or where it is requisite to wash them for starch-making, it will be found a very valuable acquisition.—*M. J. B.* [We have long used a washer similar to that here figured—differing from it, indeed, but in one particular; that one, however, of considerable importance. The arms here represented as containing the sockets in which the axle of the cylindrical frame revolves, are in our machine not vertical and straight, but arched, and terminating in extremities overhanging the ground, considerably beyond the cistern to which they are attached; the cylinder, too, revolves not in sockets pierced *in* these arms, but in Ys at the side of them; and after—by its revolution—the potatoes in it have been cleaned, chains from the extremities of the arms are hooked into eyes on its axle, and as the rotation proceeds, these, winding up on the axle, lift the cylinder out of the water, and bring it to a position overhanging a box or barrow which has been placed beside the cistern. The trap-door being opened, the potatoes fall into this barrow and are easily removed.]

THE INFLUENCE OF PASTURE ON SHEEP REARED ON IT.

BY MR. WILLIAM HOGG, STOBOHOPE, PEEBLESSHIRE.

Sheep, as they exist in this country, have a twofold character—a general character, or what belongs to them as a species, and a particular character, or that temperament of constitution which they derive from the pasture on which they are bred. The qualities essential to them as a species are, producing wool each year after being one year old, shedding two incisor teeth, cloven-footed, wild; for domestication is an artificial state, effected only after considerable intimacy, and tasting of human food—this reconciles sheep to human company and human kindness, and disposes the creature to look to man for help in every emergency. These inherent peculiarities belong to sheep as a species. Before tracing their connection with the pasture, it will be necessary to state that pasture may justly be considered as of two divisions—dry, firm, lea pasture, often less or more intermixed with heath. This soil produces the finer grasses, though not in great abundance; the animal which it rears is small sized, of a compact form, hardy, excretions of all kinds small, constitution sound, considerable flow of animal spirits, not easily overcome with privations, and, as the system in all its parts is, as it were, crowded together, it is subject to inflammatory diseases, whether raised by external injury or by the suppression of its natural evacuations. Another description of pastures are such as are spread out on an easy, downy surface. Here flourish all the strong coarser grasses, with a good part of those found in the former division; but they are here rough in the stem, and hold far more fluidity—all the plants peculiar to a damp, deep soil arrive here at perfection, and a soft, *lathy* quality pervades the whole. The animal here feeds to excess—viscera increase to a great size and weight—the carcass is large, loose, and incompact—staples of the wool generally long, inclining rather to coarseness, if pains be not taken to keep the fleece pure—not much animation—and, for the most part, in their fifth year, swell out to a great belly. The constitution does not now become invariably unsound, it rather becomes unwieldy, and burthensome for the animal to search for and gather its food; evacuations at all times profuse, and that natural purgation common to all sheep in spring is here apt to be continued well into summer, which not a

little delays the animal's mending. The diseases peculiar to such a constitution and such a pasture are of a plethoric description. If the spirits are broken by any misfortune, ill-usage, [fright by dogs] or a severe winter, the rot, with all its enfeebling symptoms, appears. Should this disease not manifest itself, yet the creature falls into an unprosperous, unthriving condition, having slight signs of sundry diseases though the exclusive symptoms of none. It, however, turns useless and dies. From these facts it must not be surmised that I suggest this as the common fate of entire stocks bred on soft pastures. Though the constitution is far from being unsound, yet it is quite inferior to those reared on the first division: it is not so strong and hardy. The soft constitution is burthened with infirmities and disabilities which the former is altogether unconnected with, and an interruption of thriving, which ill-usage or ill seasons bring on individual sheep of this constitution, generally terminates in the rot, or ailments similar to it.—Again, almost each distinct pasture gives a tinge to the fleece; this tincture is generally attributed to the color of the upper stratum of the soils; and, when we consider how assiduously thriving sheep amuse themselves on disruptions or openings of the stratum, this cannot be doubted; yet there is an imbuing quality in the herbage which communicates a tinge to wool independent of that inserted into it by friction; but whether this is produced by the quality of its food after being eaten, or is imparted to the wool as the animal traverses its pasture in search of food, I can scarcely determine. But pasture exercises an almost uncontrollable power over the shape. If it does not interfere too much with the breed, the pasture will adjust the size to what it can itself support; but how it determines the external shape remains as yet unaccounted for. In some cases the shape is unexceptionable, that is, the figure, motion, and mien of the stock indicate strength, spirits, and health; in others, it is ill-proportioned or defective in those points which ensure animation and activity.—The most common as well as the most hurtful defects are, low and thin in the fore quarters, coarse and lumpish in the posteriors, narrow or sharp-backed—its gait oblique and ambling, splay-footed, &c. Though the last two are conspicuous among individuals, they can scarcely be said to be peculiar to a stock in general, but the obstinacy with which any of these defects resist a change for the better indicates they are communicated by the soil, are interwoven with the constitution, and, if strenuous and uninterrupted means are used for their removal, they may, in a small measure, disappear, or the distinguishing peculiarities of the deformity not be so strongly marked. But, rather than relinquish the animal altogether, if vigorous exertions are still made for their utter suppression, the constitution not unfrequently yields with the struggle—it falls into an unprosperous, sickly state, and, finally, ends in being an unprofitable, useless creature. Indeed, man, for no end whatever, regularly and constantly interferes with the propagation of sheep, though accession of fresh blood be necessary at times, for keeping the animals healthy, recruiting the spirits, increasing animation, &c.; yet an often transmission of *new blood* [crossing with a different breed] into the progeny prevents the spirits from acquiring a permanent and steady flow or the body from settling into a fixed and useful proportion of strength. From an actual survey of the position, altitude, and qualities of such an extent of hill-pasture as is generally set off as a sheep-farm, one accustomed to the rearing of sheep stocks, and to notice the connection which exists between the animal and its pasture, may discover with tolerable certainty whether the constitution will be hardy or sickly—whether of a large or small bone—whether yield a scanty or abundant fleece; and, from these peculiarities, may be enabled to say, with an accuracy which may be depended on, and which will be found in general to be correct, what are the most prevalent diseases to which the stock is liable; but the properties in the soil which so forcibly confer the external figure have never yet, that I know, been discovered. Wherever that plastic power resides, I am convinced that the way and manner which the sheep accustom themselves to, in pasturing their allotted range, has not a little influence in forming the exterior shape; and it is certain that the method of pasturing is regulated by the soil, so that still the qualities of the pasture lie at the foundation of all peculiarities, whether natural or acquired; but yet an uneasy manner of collecting the food, if continued in for a length of time, may come in to the aid of those occult qualities in the soil which give the shape, and enable them to act with greater and more certain vigor. It may be thought that, if the figure of each individual in the stock is unexceptionable in its first application to the pasture, there will be no difficulty in perpetuating this shape almost to any length of time; the reverse, however, is certain. The pasture may accord with the proper figure—may support it in its most important points; but if an adverse property reside in the pasture, *it will imperceptibly alter the original form, by imposing on each successive crop of lambs that mould and manner which it is its own exclusive property to give.**

There is a train of circumstances which never fail to alter the true shape, not only of the subject on which they immediately act, but also on their progeny. Suppose an individual sheep, or say stock of sheep, are reduced very low in habit by the sufferings of a severe winter: First season they somewhat shrink from the true figure; but suppose, as is often the case, that for two or three seasons the same privations continue, the departure from the true figure is evidently on the increase, is transmitted to the issue, and the deformity becomes in a sense habitual, though not in so absolute a degree as that which the soil imposes. In this case, if good seasons and prudent management coöperate, a restoration of the right shape is possible; but to establish a true and fashionable form on a stock whose plastic influence seems to confirm a defect in the shape is impossible. The change of stocks from the Heath to the Cheviot breed has not a little altered the disposition, look, and manner of sheep; but when all traces of the former are completely obliterated, and the peculiarities of the latter startlingly confirmed, what reprehensible points the pasture was the cause of in the old breed are still found to be blemishes in the new. From the above notices, it may be inferred that the proper figure and shape of some stocks can with far greater easiness be brought to a just proportion of parts, and kept at them

* So, too, we have maintained as to grain, tobacco, fruit, &c.—Nature will not be forced; soil and climate will force things connected to them to alter their nature to suit them while *they* remain unchanged. [*Ed. Farm. Lib.*

as a right standard, than others where the qualities in the soil operate to the production and continuance of defects. This is found in fact to be the case. Some stocks require little attention; others, if the manager make strenuous and incessant endeavors to establish a useful figure, may, perhaps, enfeeble the whole system by too frequent accessions of new blood; for, to continue sheep profitable, healthy, and beautiful, the line should not be too often disturbed with intromissions from other families, however pure.

To write ever so explicitly on this subject can convey no perfect notion to another person's mind of the dissimilarity which exists between sheep stocks reared on different pastures; one single look over them would make the idea more distinct, and more certain of the inequality, than any words can convey; but the fact that each pasture impresses its peculiar shape, air, and manner, need not be doubted, and this unlikeness exists after every safe method is taken to bring them to a uniformity.

[Jour. of Highland and Agr. Soc. of Scotland.

BEES.—*Statistics of Swarming.*—In this account of swarming, the Bees, being in the common straw-hive, were left to follow their natural inclination. The statement extends over a period of 10 years. 40 old hives produced 64 swarms; three swarms flew away, two of which were lost through inattention; 16 swarms were in May, 38 in June, 9 in July, and 1 in August. Five old hives did not swarm, one swarm swarmed once, and two swarms sent forth each two colonies; three of the old hives swarmed thrice each. The worst honey seasons were 1839, 1841, and 1845, in which years the average of swarms per old hive was the greatest, being respectively 2¼, 2 1-5, and 2. In the best honey seasons there was less swarming, the average being 2, 1, 1¾, and 1½. The earliest swarm in the 10 years was on May 9th, the latest on August 11th; the earliest hour of swarming, 9 o'clock, A. M.; the latest, half-past 3 o'clock, P. M. The greatest weight of first swarm, 6 lbs.; of second swarm, 4¾ lbs. The second swarms were generally, accompanied with more than one queen. This was also the case with two first swarms, which, doubtless, arose from the old queens having died about the commencement of the swarming season. In one of the cases the queen was observed dead in front of the hive. Many thousands of the Bees continued to cluster around the hive till the 10th or 11th day, when a swarm of 6 lbs. left, in company with several queens.—B. T. [Foreign paper.

☞ The friends of Agriculture will be happy to learn that Hon. J. C. CALHOUN has been appointed to deliver the next Anniversary Address to the South Carolina Agricultural Society—*The cause is looking up.*

PRICES CURRENT.

[*Corrected, December 27, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort....℔ 100 lb.	3	75	@—	—
Pearls, 1st sort, '45	4	12½	@—	—
BEESWAX—American Yellow	—	29½	@—	30½
CANDLES—Mould, Tallow..℔ lb...	—	9	@—	11
Sperm, Eastern and City	—	26	@—	38
COTTON—From.....℔ lb.	—	6¼	@—	9¼
COTTON BAGGING—American...	—	12	@—	13
CORDAGE—American.....℔ lb.	—	11	@—	12
DOMESTIC GOODS—Shirtings, ℔ y.	—	5½	@—	11
Sheetings	—	7	@—	15
FEATHERS—American, live	—	28	@—	32
FLAX—American	—	7	@—	7½
FLOUR & MEAL—Genesee, ℔ bbl.	5	62½	@—	—
Troy	5	62½	@—	—
Michigan	5	56¼	@ 5	62½
Ohio, flat hoop	5	56¼	@ 5	62½
Ohio, Heywood & Venice	6	75	@—	—
Ohio, via New-Orleans	—	—	@—	—
Pennsylvania	—	—	@—	—
Brandywine	—	—	@ 6	—
Georgetown	5	75	@ 5	87½
Baltimore City Mills	—	—	@ 5	75
Richmond City Mills	7	—	@—	—
Richmond Country	5	75	@ 6	—
Alexandria, Petersburg, &c.	—	—	@ 5	75
Rye Flour	4	25	@ 4	37½
Corn Meal, Jersey and Brand	4	25	@ 4	37½
Corn Meal, Brandywine.....hhd.	18	—	@—	—
GRAIN—Wheat, Western..℔ bush.	1	20	@ 1	30
Wheat, Southern.....new	1	20	@ 1	25
Rye, Northern	—	80	@—	—
Corn, Jersey and North...(meas.)	—	80	@—	83
Corn, Southern.....(measure)	—	70	@—	—
Corn, Southern.....(weight)	—	70	@—	71
Oats, Northern	—	45	@—	—
Oats, Southern	—	38	@—	40
HAY—North River.....bales	—	95	@ 1	—
HEMP—American, dew-rotted..ton	80	—	@95	—
" " water-rotted.....125	—	@175	—	
HOPS—1st sort, 1845	—	20	@—	35
IRON—American Pig, No. 1	35	—	@37	—
" Common	25	—	@30	—
LIME—Thomaston.....℔ bbl,	—	97½	@—	—
LUMBER—Boards, N.R., ℔M. ft. clr.	35	—	@40	—
Boards, Eastern Pine	10	—	@11	—
Boards, Albany Pine.....℔pce.	—	8	@—	18
Plank, Georgia Pine.....℔M. ft.	33	—	@40	—
Staves, White Oak, pipe. ℔ M....	48	—	@50	—
Staves, White Oak, hhd	38	—	@40	—
Staves, White Oak, bbl	28	—	@30	—
Staves, Red Oak, hhd	30	—	@31	—
Hoops	25	—	@30	—
Scantling, Pine, Eastern	14	—	@16	25
Scantling, Oak	30	—	@35	—
Timber, Oak.....℔ cubic foot	—	25	@—	37
Timber, White Pine	—	18	@—	25
Timber, Georgia Yellow Pine	—	30	@—	35
Shingles, 18 in.....℔ bunch	1	75	@ 2	—
Shingles, Cedar, 3 feet, 1st quality.	—	—	@24	—
Shingles, Cedar, 3 feet, 2d quality.	20	—	@22	—
Shingles, Cedar, 2 feet, 1st quality.	—	—	@17	50
Shingles, Cedar, 2 feet, 2d quality.	15	—	@16	—
Shingles, Cypress, 2 feet	11	—	@13	—
Shingles, Company	—	—	@29	—
MUSTARD—American	—	16	@—	31
NAILS—Wrought, 6d to 20d...℔ lb.	—	10	@—	12½
Cut, 4d to 40d	—	4	@—	4½
PLASTER PARIS—℔ ton	2	62½	@—	—
PROVISIONS—Beef, Mess, ℔ bbl...	8	—	@ 8	50
Beef, Prime,	5	—	@ 5	50
Pork, Mess, Ohio	13	25	@13	37½
Pork, Prime, Ohio	10	25	@10	50
Lard, Ohio.....℔ lb.	—	8	@—	8½
Hams, Pickled	—	7½	@—	—
Shoulders, Pickled	—	5½	@—	—
Sides, Pickled	—	6½	@—	—
Beef, Smoked.....℔ lb.	—	7	@—	7½
Butter, Orange County	—	18	@—	20
Butter, Western Dairy	—	15	@—	17
Butter, ordinary	—	12	@—	14
Cheese, in casks and boxes	—	7	@—	8
SEEDS—Clover.....℔ lb.	—	10	@—	11
Timothy.....℔ tierce	15	—	@17	—
Flax, Rough	10	37½	@—	—
SOAP—N. York, Brown.....℔ lb.	—	4	@—	6
TALLOW—American, Rendered...	—	7½	@—	7¾
TOBACCO—Virginia.....@ lb.	—	3	@—	6
North Carolina	—	3	@—	5
Kentucky and Missouri	—	3	@—	7
WOOL—Am. Saxony, Fleece,.℔ lb.	—	38	@—	40
American Full Blood Merino	—	36	@—	38
American ½ and ¾ Merino	—	30	@—	33
American Native and ¼ Merino...	—	26	@—	28
Superfine, Pulled	—	29	@—	31

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TREATISE ON MILCH COWS.

TREATISE ON MILCH COWS: WHEREBY THE QUALITY AND QUANTITY OF MILK WHICH ANY COW WILL GIVE MAY BE ACCURATELY DETERMINED, BY OBSERVING NATURAL MARKS, OR EXTERNAL INDICATIONS ALONE; THE LENGTH OF TIME SHE WILL CONTINUE TO GIVE MILK, &c. &c. By M. FRANCIS GUENON, France. Translated from the French of the Author, for the Farmers' Library, by N. P. TRIST, late U. S. Consul at Havana. With Practical Observations and Remarks on Cattle, by JOHN S. SKINNER.

CHAPTER I.

ACCOUNT OF THE DISCOVERY.

To give the history of my discovery, I must speak of myself. My narrative shall be succinct and short, although my labors have been protracted. But this is a condition attached to discoveries generally; we must meditate long upon what an instant has sufficed to reveal or suggest to us. It will be seen that, in my case, difficulties were always renewing.

I am the son of a gardener, and I followed for a long time this trade of my forefathers. Nature had given me an observing turn of mind; I was fond of bringing things together—of instituting comparisons between them—of deducing consequences. At an early period I became possessed by the idea that I was destined to make some important discovery in the branch of industry which I followed. Was this the suggestion of mere vanity? Be it as it may, the thought took root in my mind, and became for me a fixed idea. With a view to arriving at this wished-for discovery, I studied the works of the best writers on Botany and Agriculture; I learned Geometry and the art of Drawing, so far as it seemed necessary to me. I followed up all the ramifications of the vegetable kingdom, and applied myself to the study of the external signs by which plants and vegetables of different sorts might be distinguished, and their qualities and productiveness might be known beforehand.

To do this was to accomplish a good deal, no doubt; but my mind, still possessed by the idea of the great future discovery, was never at rest. I was, like Ahasuerus, under the hand of the angel; a voice within was constantly crying out, "Go on!" and I felt myself impelled forward; but I had no glimpse of the goal to which I was tending.

Chance led to the discovery of the famous Tyrian purple; to chance also is due an observation which was the germ of my discovery, and constitutes the basis of my method. When fourteen years of age, I used, according to country cus-

tom, to drive our only Cow to the grazing ground. I was very fond of her, and could have identified her among ever so many. One day, as I was whiling away the time in cleaning and scratching my poor old companion, I noticed that a sort of bran or dandruf detached itself in considerable quantities from certain spots on her hind parts, formed by the meeting of the hair, as it grew in opposite directions; which spots I have since called *ears*, from the resemblance they often bear to the bearded ears or heads of wheat or rye.* This fact attracted my attention, and I recollected having heard one of my grandfathers say that it was probable there were external marks on Cows, whereby their good qualities or their defects might be known—just as we judge of the vital force of a plant and its qualities by means of its leaves and the lines on its skin. My own thoughts now took this turn. Reflecting on the subject, I arrived at the conclusion that if, in the vegetable kingdom, there exist external signs, whereby the good and the bad qualities of a plant can be positively known, there ought to exist in the animal kingdom, also, marks whereby we may judge, by inspecting an animal, of its qualities, good and bad; and I thought that I had discovered one of these signs.

All this, however, was as yet but mere speculation—a brilliant theory, which experience might belie: it was necessary to interrogate Nature. The Cow which I tended was a good milker. I have already said that I knew her perfectly. I examined other Cows within my reach, to see if I should find the same signs in them. I sought for the bearded *ears* (*quirls*), and scratched those spots in quest of dandruf; the abundance or the scarcity of this being what first engaged my attention. Every new Cow was compared with my own as a standard, and her superiority, equality or inferiority determined in my own mind.

From this moment I spared nothing to follow up my observations; no fatigue was too great for me; I have often traveled several leagues in order to examine a single Cow. What was my exultation when, after I had formed my judgment of a Cow, the questions with which I belabored her owner brought forth answers that corroborated its accuracy! How often has it happened that people were convinced that the animal whose qualities I was pronouncing upon must have been previously known to me! My secret was the cause of astonishment to many; I took good care to keep it to myself.

In the course of the comparisons thus instituted by me, with reference to the dandruf alone, which was at first the only thing that governed me, I had occasion to remark that great diversities existed among Cows, in respect to the shape of the bearded ears (*quirls*) which produced the dandruf. This suggested a new train of reflections and observations, which resulted in my becoming convinced that these *shapes* were the signs by which to distinguish Cows, and to know the good and bad qualities of every individual among them. From that moment my discovery was made; but it was necessary to digest it into a system —above all, to establish its accuracy in all its parts, by proofs which should carry my own conviction into the minds of others. It was here that all my courage and perseverance was put in requisition.

It did not suffice to have discovered signs that were characteristic of different sorts of Cows; it was necessary to make sure that the same mark might always be relied upon as a positive and certain sign of the same perfection or defect.—

* These marks are, in some parts of our country, called *quirls*. Their occurrence in horses (particularly on the neck, under the mane) is well known to be a sign of *blood*. This is a remarkable coincidence; and it seems far from improbable that the discovery made by the author in regard to neat cattle will lead to similar discoveries respecting other domestic animals. [*American Translator.*

This could not be effected except by studying a vast number of individuals—by comparing them together—taking into consideration the countries from which they came—their stature—their yield. This was not all: they had to be classed. Conceive what toil this task involved for me, a plain child of Nature, who had no idea of such a classification, and found myself under the necessity of establishing one. The endeavor was one to absorb me entirely; I gave up my calling; I traveled about, visiting cattle markets, fairs, cow-stables; I questioned and cross-questioned all who might be expected to know most on the subject—husbandmen, dealers in cattle, men of the veterinary profession; I became convinced that my discovery had not been anticipated by any one. The marks for distinguishing a good Cow from a bad one varied according to the notions of each individual. Some looked to the shape of the horns—others upon that of the udder; some judged by the shape of the animal, or the color of her hair—others were determined in their choice by something else. But, in these various modes of judging, all was vague and uncertain. I became confirmed in the belief that I had made the important discovery of signs that were positive and certain; and, in order the better to satisfy myself of the solidity of the ground upon which my method was to rest, I took the precaution to return to the same localities at different times and seasons, that I might trace and ascertain the effects which might attend these variations of Nature. All my observations were accurately noted down; and I could at length flatter myself with having acquired a mass of facts which gave solidity and consistence to my system, and imparted the character of positive certainty to that which at first had been but a probable conjecture.

In 1822, I began to deal in cattle on my own account. This trade brought under my eyes a great number and variety of Cows from all quarters—from Switzerland, Holland, Brittany, Poitou, &c. &c.; and I had better opportunities than before for thoroughly examining the marks of these different races. My observations were multiplied, and I became convinced anew that all individuals possessing the same marks belonged to the same family, whatever might be the country of their birth; that these marks were an infallible indication of the same degree of superiority or inferiority; in a word, that Nature, always consistent with herself, acted, at all times and places, in the same way, and was always governed by the same laws.

For between seven and eight years, I had been incessantly engaged in establishing order among my observations, and arranging the results into one consistent whole. I established a classification, founded upon the shape or outline of the different marks: Cows were first divided into classes or families; then, in each of these classes, there was a threefold division, according to size—the *tall* or *high*, the *medium*, and the *low*; finally, each class was subdivided into orders, according to the diminution and the deformity of the distinctive mark of the class, as found in the different individuals belonging to it. This task was an immense one for me, and cost me a degree of trouble and an expenditure of time, of which a conception may be formed by considering how many comparisons and combinations were necessary to a person so unversed in scientific methods, before my materials could be reduced to order, and I could form a distinct and precise idea of my own discovery.

These difficulties, which might have disheartened any other person, did not discourage me. A system was to be created, and I created it. In 1828, I addressed to the Academy of Bordeaux a request, having for its object that my method should be examined and reported upon. I was not yet willing to disclose

my secret entirely; my object was to get the reality of my discovery and its results attested to. The Academy, without adopting my conclusions, did nevertheless make honorable mention of me, at its sitting of the 3d of June following, in these terms:

"M. Francis Guénon, of Libourne, possessor of a method which he deems infallible for judging, by mere visual examination, of the goodness of Milch Cows, and the quantity of milk which each can yield, has solicited the Academy to cause the efficaciousness of this method to be tested by repeated experiments. The case presented by this request was one of a secret method of judging, which the possessor was not willing to reveal. On the other hand, it seemed difficult to admit that the external signs, whatever they might be, by which M. Guénon judges, could always bear a proportional relation to the quantity of milk yielded by a Cow. Nevertheless, the Academy deemed it proper to appoint a Committee charged with making the examination.

"Trials have been made, with the care and under the precautions necessary for precluding all collusion. The Cows used for the purpose belonged to three different herds, and amounted to thirty in number, and the result has been to establish, to the satisfaction of the Committee, that M. Guénon really possesses great sagacity in this line. So long, however, as his method shall be kept secret, it cannot be judged of nor rewarded by the Academy.

"Governed by these considerations, the Academy, having ascertained from M. Guénon that he is willing to submit to every test that may be proposed, and to disclose his secret upon receiving a just indemnity, has referred him to the Prefect, and has engaged to recommend him to the favorable notice of that magistrate, who is ever disposed to promote all that tends to improvement."

Here the matter rested at that time. I did not then make up my mind to give my secret to the public; but I persevered in my observations and experiments, in order to perfect my discovery. In 1837, the Agricultural Society of Bordeaux determined to ascertain for itself what reality there might be in my system.—The result surpassed its expectation; the experiments made, in presence of the Committee appointed for the purpose, left no doubt as to the certainty of my method. Here are the terms in which the Committee expressed themselves in their report:

AGRICULTURAL SOCIETY OF BORDEAUX.

GUENON DISCOVERY.... MILCH COWS.

Report to the Agricultural Society of Bordeaux.

Gentlemen: The Committee appointed by you to examine into the discoveries of M. Francis Guénon, of Libourne, have the honor to submit to you the result of their investigations.

M. Guénon has established a natural method, by means of which it is easy to recognize and class the different kinds of Milch Cows, according to

1st. *The quantity of milk which they can yield daily.*
2d. *The period during which they will continue to give milk.*
3d. *The quality of their milk.*

Down to the present day, Gentlemen, the writers and professors who have the most particularly occupied themselves with the bovine race have been unable to do anything more than indicate some vague signs for judging of the fitness of Cows for secreting milk.

After more than twenty years of observations and researches, M. Guénon has succeeded at length in discovering certain natural and positive signs, which constitute the basis of his method; a method henceforward proof against all error.

Sensible of the necessity that your Committee should be fully convinced, and that they could not but look with some degree of distrust upon any results of the proposed trials of his method, unless they should know that those results rested upon tangible facts, and were nowise dependent upon guess work, M. Guénon began by imparting his secret to your Committee, and making them fully acquainted with the positive signs upon which he has founded his method. By means of these signs, which are all external and apparent, he has established eight classes or families, which embrace all the varieties of the Cow that are to be met with in the different parts of this kingdom. Each of these classes or families is subdivided into eight orders. It is divided, also, into three sections, so that each of the sections comprehends the eight orders; this last division

having reference merely to the size of the Cows, and serving to distinguish animals which, being the same in respect to the characteristic signs that serve to fix the class and the order to which they belong, differ in hight alone, and in their yield so far only as this is dependent upon size.

By means of this classification, which is no less clear and distinct than simple, we are enabled,

1st. To distinguish with ease, in any herd of Cows, each individual comprised in it, according to the quantity of milk which she is capable of yielding—from twenty-six quarts a day down to next to nothing, and all intermediate quantities.

2d. To know the qualities of the milk which each will give, as being creamy or serous.

3d. To determine during what time, after being got with calf, the Cow will continue to give milk.

This method—so precious, from the application of which it is susceptible, whether we be concerned in the yield of milk only, or whether we avail ourselves of it for the improvement of breeds, which are constantly liable to deterioration from mismanagement in crossing—acquires a new interest when we consider that it is applicable, not to full grown animals alone, but also to calves at so early an age as three months. Thus, on the one hand, it affords the means of forming a sure judgment of full grown animals, in regard to which we are often misled, by their form and their parentage, to entertain great expectations which are never realized; and, on the other hand, it secures the improvement of herds, by enabling us to dispose at once of those calves which can never repay the trouble and cost of rearing them.

This important end, hitherto so vainly aimed at, had it at length been attained? To ascertain this point is the duty with which your Committee were charged. The method of M. Guénon having been revealed to them, it remained to ascertain how far the essential signs upon which it rests might be susceptible of rigorous application.

With this view they passed several days in visiting a number of pasture fields, situated in localities that differed from each other, in order that the experiments might be made upon animals of different breeds, and under varying circumstances. They deem it proper to enter here into some details respecting their mode of proceeding, persuaded that you will thereby be the better enabled to understand and appreciate the merits of this method, and to form a correct judgment of the extent to which your protection is due to a discovery, which is submitted to you by the author with the greater confidence, because it bears directly upon the prosperity of the agriculturist.

Every Cow subjected to examination was separated from the rest. What M. Guénon had to say in regard to her was taken down in writing by one of the Committee; and immediately after the proprietor, who had kept at a distance, was interrogated, and such questions put to him as would tend to confirm or disprove the judgment pronounced by M. Guénon. In this way we have examined, in the most careful manner—note being taken of every fact and every observation made by any one present—upward of sixty Cows and Heifers; and we are bound to declare that every statement made by M. Guénon with respect to each of them, whether it regarded the quantity of milk, or the time during which the Cow continued to give milk after being got with calf, or, finally, the quality of the milk as being more or less creamy or serous, was confirmed, and its accuracy fully established. The only discrepancies which occurred were some slight differences in regard to the *quantity* of milk; but these, as we afterward fully satisfied ourselves, were caused entirely by the food of the animal being more or less abundant.

The results of this first test seemed conclusive; but they acquired new force from those of a second trial, in which the method was subjected to another test, through M. Guénon and his brother. Your Committee, availing themselves of the presence of the latter, caused the same Cows to be examined by the two brothers, but separately; so that, after a Cow had been inspected, and her qualities, as indicated by the signs in question, had been pronounced upon by one of the brothers, he was made to withdraw; then the other brother, who had kept aloof, was called up, and desired to state the qualities of the same animal. This mode of proceeding could not fail to give rise to differences—to contradictions, even—between the judgments of the two brothers, unless their method was a positive and sure one. Well! Gentlemen, we must say it—this last test was absolutely decisive: not only did the various judgments of the two brothers accord perfectly together, but they were in perfect accordance, also, with all that was said by the proprietors in regard to the qualities, good and bad, of every animal subjected to this examination.

To the proprietors and to the bystanders, all this was the more surprising, from the fact that the examination was no less prompt than its results were certain. It was, however, easy to perceive that they, ignorant as they were of the nature of the discovery, had but little confidence in it; and that they ascribed the cunning of M. Guénon simply to a great practical familiarity with Cows.

As to ourselves—for whom, as we have already informed you, Gentlemen, the method was no longer a secret—it was with constantly renewing feelings of interest and astonishment that we followed up these examinations and contemplated the accuracy of their results. Two members particularly of the Committee, whom their special pursuits and their physiological knowledge of domestic animals entitle to great confidence, had, from the very first examination, been struck with the truth and strength of the system, the successful applications of which were multiplying under our eyes. This system, Gentlemen, we do not fear to say it, is infallible. The signs upon which it is founded, ever constant, invariable in the place which they occupy, are strongly impressed upon the animal by the hand of Nature. To appreciate them becomes an easy task; all that is requisite being, after having examined the animal and ascertained what marks she bears, to examine the drawings and fix upon the one in which those same marks appear. Then, by means of a brief but precise explanation which refers to that drawing, the qualities of the animal under examination become known, and the class and order to which she naturally belongs are indicated. It is by proceeding thus—by examining, first, the marks upon the animal, and then seeking among the drawings for the one in which those marks were reproduced—that the members of your Committee, after witnessing the first experiment, have been able themselves to apply the system, and to form judgments which were afterward corroborated in the same way that those of M. Guénon were.

In the light of our admiration, Gentlemen, it was a subject of lively regret that the whole Society were not present; but we have the consolation of hoping that each of you will soon experience the pleasure which we have enjoyed, and have it in his power to apply this discovery to his own use and benefit. M. Guénon is not disposed to keep it secret; he proposes, so soon as a list of three thousand subscribers shall have been filled, to publish a work, in which his system, completely developed, shall be placed in the strongest light. The distinctive signs of each class and each order will be exactly described, and accurately represented by engraved or lithographic drawings; and the quantity of milk which each description of Cow is capable of yielding will be stated.

By means of this faithful guide, which is within the capacity of every understanding, errors will be dispelled, and the ability to form correct judgments of Cows will become common to all classes o husbandmen. Before long, none but Cows and Bulls of the first order will be used to breed from; this race of animals, which has become degenerate through bad crosses, will be elevated; and, as in other species of domestic animals, individuals of pure blood will be readily obtainable. Then, guided by sure and positive knowledge respecting the future qualities of young Cattle, we shall no longer rear, at great expense for three or four years, a Calf whose secretion of milk can never be otherwise than small in quantity and poor in quality; while, on the other hand, we shall no longer blindly consign to the butcher, young animals that would repay all the care that could be bestowed upon them.

These considerations will, we feel persuaded, Gentlemen, determine you to encourage M. Guénon to the publication and dissemination of a method which promises to be so useful to the agriculturist. How many poor families, in the neighborhood of large cities, where there is always a great consumption of milk, find in a small number of Cows the means of their subsistence! How extensive a branch of trade is supported by the production of butter and cheese in many of our Provinces—Brittany, Normandy, the Pyrenees, and others! Holland and Switzerland, those countries of fine pastures, are they not indebted to this branch of husbandry for a prosperity which is ever reproducing itself, and never wearing out—a prosperity less rapid, less brilliant, perhaps, than that which results from adventurous traffic, but safer at least for those who depend upon it; which is never deceptive; which, more than any other, attaches man to his country, and favors morality, and seems sheltered from those political tempests which, in other lands, so often prostrate the tallest fortunes.

[Signed] GUICHENET, *Veterinary Professor of the Department.*
LECONTE.
F. PELISSIER.

After the reading of this Report, the Society decreed as follows:

1st. That a gold medal be awarded to M. Francis Guénon.

2d. That he be proclaimed a Member of this Society.

3d. That fifty copies of his work on Milch Cows be subscribed for.

4th. That a thousand copies of the Report be printed for distribution among the Agricultural Societies of France.

The foregoing proceedings took place at the General Meeting of the Society at the House of the Prefecture, on the 4th of July.

A true extract.

[Signed] RICHIER, *Secretary General of the Society.*

AGRICULTURAL SOCIETY OF AURILLAC.

At its General Meeting of the 26th May, the following Report was presented and read on the subject of the experiments which I had been called upon to make:

Report.

Gentlemen: M. Francis Guénon, a husbandman of Libourne, has established a method, deemed by him infallible, by means of which, upon a mere inspection of any Milch Cow, she may be judged of, and we may know the quality of her milk, the quantity of it which she is capable of yielding, and also the time during which she can give milk.

A Committee appointed by the Agricultural Society of Bordeaux, and composed of several well informed agriculturists, and of a very distinguished Professor of the Veterinary art of the Department of Gironde, had already borne testimony, after putting it to numerous tests, to the efficaciousness of the system of M. Guénon; and the result of its observations had been published in a very remarkable Report, addressed to all the Agricultural Societies of France.

Your Society, considering that this discovery might be of high importance to our country, which derives its income chiefly from the product of Milch Cows, entered into correspondence with its author, and gladly accepted his obliging offer to come to Auvergne and subject his method to the test of experiment.

Yesterday, the 25th of May, M. Guénon arrived at Aurillac, and immediately proceeded with the members of your Committee to the *Veyrac* farm, belonging to the President of the Society.—He examined with the utmost care the fine cow stable of that domain, which embraces one hundred Cows, of the best varieties that we possess. He then began his experiments upon a number of Cows which were presented to him, and which had designedly been selected from among the best, the moderately good, and the most indifferent of the establishment. Upon each of these separately, M. Guénon pronounced with precision, both in regard to her daily yield of milk, and to the time during which she continued to give milk after being got with calf. We must acknowledge, Gentlemen, that his decisions corresponded almost invariably with the statements obtained from the persons in whose charge the Cows are. The only variances we had to notice were some very slight ones in regard to the quantity of milk. On this point, we must call your attention to the fact that the Cows of that establishment are always fed high, upon clover or other artificial grasses which considerably augment the quantity of milk; and that this may have caused the mistake of M. Guénon, which consisted in his pronouncing the yield to be a little less than it really is. It is to be remarked that he was totally unacquainted with the usages of the country in regard to the feeding of Cattle.

In order thoroughly to convince your Committee of the reality of the discovery, M. Guénon made us acquainted with the different signs upon which his method rests. With reference to these signs, which are external and apparent, and stamped by the hand of Nature upon each animal, he has established eight classes or families, that comprehend all the varieties of the Cow found in the various Provinces of France. Each class is divided into eight orders; and each of these orders into three sections, according to size, as being high, of medium hight, and low.

According to the numerous observations of the author, all Cows belong to some one of these classes or families, and take their place under some one of the eight orders of the class. Each class possesses marks differing in shape and size from those of the other classes; and these marks are easy to distinguish, on merely looking at them. In each class, the Cows of the first orders are the best of the class, and the yield of milk is in proportion to the order: so that the two higher orders are the most productive, the third and fourth orders tolerably good, and the others falling off more and more, according to their grade.

M. Guénon applied his system, in our presence, to a number of Cows which were presented to him a second time: he made us remark their various signs, which differed in size and shape, and were larger or smaller according as the Cow was a good or a bad milker. He informed us that his system is equally applicable to young animals, and that their future qualities in regard to the

productive of milk can be judged of with equal certainty. In corroboration of this, he caused us to notice the same signs upon Calves three or four months old, and also upon Bulls destined for the next covering season. The cowherds stated that the Calves which had been assigned by him to the first orders were from Cows that gave a great deal of milk. Upon two splendid Bulls, of the fine breed of SALERS, which were of the same age, and exactly alike in hair and size, M. Gueton passed very different judgments: the one he pronounced good, and assigned to the first order of his *Flandrin* class; the other he pronounced bad, and assigned to the fifth order of his *Hyperonal* class.* He justified these judgments by very precise comparisons, and made us remark the difference that existed in the signs of the two animals.

This day, the 9th of May, M. Gueton has made new experiments at the Cattle Fair of the town of Aurillac, in presence of several members of the Central Agricultural Society, and of the Sub-Societies, and of a great number of land-owners and agriculturists of Cantal and the neighboring Departments. The following is the manner in which your Committee have thought proper to proceed. Each Cow was examined separately by M. Gueton, who wrote his notes upon her, and delivered the paper closed to one of us. Immediately after, another member of the Committee questioned the owner of the Cow, or the person in charge of her, in regard to her daily yield of milk, its quality, and the time during which she continued to give milk after being put with calf. The answers were taken down in writing, and then compared with the notes written by M. Gueton. They were generally found to accord, and proved, to the satisfaction of your Committee and of every one present—all of whom attended with lively interest to these proceedings—that M. Gueton possesses great sagacity in judging of Cattle, and that his method rests upon a sure foundation.

An incident occurred to confirm us in this opinion. A farmer played the trick of bringing up for examination a Cow that had already been examined and pronounced upon. The notes written by M. Gueton on this occasion accorded exactly in every respect, with those he had written on the former.

The method of M. Gueton has not the merit of being a brilliant theory. It rests upon facts and long experience. It is only after repeated trials, and twenty-five years of laborious researches, that its author has accomplished the task of establishing it.

We are of opinion, Gentlemen, that M. Gueton ought to be encouraged by you in the publication of a system which appears to us destined to exercise a happy influence on the advancement of one of the most important branches of rural economy. What immense advantages may there not result, particularly in Auvergne, where the raising of Cattle and the manufacture of cheese constitute the chief branch of industry, from a method which should enable us to distinguish, in a sure way, between good and bad Cows? By applying this system to Calves and to Bulls, our stock would rapidly be raised to a high point of excellence, and we should soon have in our mountains none but Cows of the best kind.

In view of all these considerations, your Committee have the honor to propose—

1st. *That there be awarded to M. Gueton a gold medal, with the effigy of* OLIVIER *de* SERRES.

2d. *That he be proclaimed a Corresponding member of the Society.*

3d. *To subscribe for twenty-five copies of his work, for distribution among the Sub-Societies of the Department.*

4th. *That this Report be inserted in the* AGRICULTURAL PROPAGATOR, *and to transmit a copy to all the Prefects and Agricultural Societies of France.*

(Signed) COUNT SAIGNES
G. DE LALAUBIE.
GENERAL BARON HUGONET.
V. DE PEYRONS, *Reporter of the Committee.*

Note.—At the same sitting, the recommendations of the Committee were adopted by the Central Society of Agriculture of Cantal.

With this highly flattering testimony in hand, I now come forward to publish the result of my silent meditations and welcome studies. Every one will be able, with the aid of the lithographic drawings attached to the work, readily to recognize the distinctive marks of the animal examined by him. These marks are visible upon the posterior part of every Cow, in the space embraced between the

* See the names of the several classes, in the chapter *On the different kinds of Cows.*

udder and the vulva. They consist of a kind of escutcheons of various shapes and sizes, formed by the hair growing in different directions, and bounded by lines where these different growths of hair meet. The varieties of these escutcheons mark the different classes and orders of Cows.

It is upon these signs that every one may rest his judgment, by attending to the remarks contained in the body of the work upon the different kinds of Cows.—They are what every body has seen, or been able to see: but what no one has attended to. For myself, I have persevered through all obstacles: neither fruitless expenses, which were enormous for one of my means: nor the malice of the malevolent: nor the cold reception of the indifferent: nor the smile of incredulity: nothing has been able to damp my zeal. Strong in my conviction, I have been sustained by it through all my trials: and it has always raised me up when all conspired to depress me.

CHAPTER II.

ON THE DIFFERENT KINDS OF COWS.

§ 1. Genuine Cows.

I HAVE, as I said, established a classification of Cows; and the reader will have become aware how much time it must have cost me to arrive at this classification. Neither the language of Science nor its method is to be expected in my work: I have had no other instructor than myself, and Nature has been my only book. I am not pretending to write a treatise of Natural History; I am only giving to the public the result of my experience and observation. The suggestions of my own mind at the different stages of my discovery have been my only guides. In following up my observations, it was requisite that order should be established among the facts noticed by me and the thoughts to which they gave rise. To designate the various figures of the escutcheons of the several classes, new names were necessary. This order and this nomenclature are of my own invention.—For the purpose of coining French names, I have not ransacked Greek or Latin vocabularies: I have adopted those which suggested themselves as naturally expressive. If they be not formed after the rules of etymology, they are at least such as every one can seize the meaning of: and my book being designed chiefly for that class of men who are for the most part strangers to belles-lettres, it will possess in their eyes the merit of not disguising things under the words used to dignify them.

I divide Cows into *Eight* CLASSES or families: and these classes each into eight ORDERS. In each class, I distinguish three different SIZES: the *High*, the *Low* and the *Medium*. This classification embraces all kinds of Cows known to me: every individual being assignable to some one of these eight classes, and to some one of the orders comprised in it. According to the *Class*, the *Order*, and the *Size* of an animal, is her yield of milk: this being always found to correspond with the escutcheon characteristic of each class: some one of which escutcheons, is recognized in every Cow, more or less perfectly defined and free from blemish, according to the degree in which she approaches to the perfection of her class. This mark consists, as I have said, of the figure, on the posterior parts of the animal, formed by the meeting of the hair that grows or points in different direc-

tions; the line of junction of these different growths of hair constituting the outline of the figure or escutcheon. Here are the names of the eight classes:

1st Class....THE FLANDERS COW.	5th Class....THE DEMIJOHN COW.
2d " .... " SELVAGE COW.	6th " .... " SQUARE SCUTCHEON COW.
3d " .... " CURVEITNE COW.	7th " .... " LIMOUSINE COW.
4th " .... " BICORN COW.	8th " .... " HORIZONTAL CUT COW.

By means of the following description of the several Classes and Orders, aided by the engraved prints attached to the work, every person can assign any Cow examined by him to her appropriate place in the classification, and consequently form an accurate judgment in regard to the maximum quantity of milk which she can yield daily, and also to the time during which this yield will remain at its maximum. It results from the numerous and oft-repeated tests to which this method of judging has been subjected, that the yield may sometimes vary from what I have adopted as the standard point; because, as I have stated, the climate, the food and the season do exercise an influence upon it. But there is one thing which never varies, which always holds good, at all times and in all places: in every one of the eight classes, the Cows of the higher orders are always the best, and those of the lower orders always the least good; that is to say, the two highest orders are always the most productive, the third and fourth orders are tolerably good, and the four others go on diminishing to the last, which may be looked upon as nullities so far as regards milk.

§ 2. Bastard Cows.

Before entering upon a detailed description of the classes severally, it is important that the reader be reminded that each class has its *Bastards;* that is to say, Cows which, although bearing a perfect resemblance to the others, do nevertheless differ from them in their yield. This resemblance deceives the most practiced eye, and is the source of many mistakes and of serious losses. In order, therefore, that the reader may be enabled to avail himself of my method, I must make him acquainted with the marks by which the bastards of each class are distinguished.

I have adopted the word *Bastard* to denote those Cows which give milk only so long as they have not been got with calf anew; and which, upon this happening, go dry, all of a sudden or in the course of a few days. Cows of this kind are found in each of the classes, and in every order of the class. Some of them are great milkers; but so soon as they have got with calf, their milk is gone. Others present the most promising appearance, but their yield is very insignificant. Cases of this kind occur every day; the most skillful judges find themselves mistaken.

When it happens that a Cow that was giving a plenty of milk loses it, all of a sudden, upon being got with calf, people do not know how to account for this loss of her milk; various causes are assigned for it, not one of which is the true one. It does not depend, as some suppose, upon the will of the animal about letting down her milk; it so happens simply because she is born so, because she is so formed and constituted.

Now there are characteristic signs, also, whereby the Bastard Cows in each of the classes and orders may be known. They are distinguished by the lines of ascending and descending hair in their escutcheon. These escutcheons are put before the reader's eyes in the Ninth plate, the drawings of which are, like the others, from nature.

In general, these Bastard Cows conceive with great facility the first time they come in heat, if they be then put to the bull. But they do not continue to give milk in any quantity; they cannot furnish enough even for the calf. Consequently if a Cow of this kind be put to the bull, it becomes necessary to wean her calf, and it falls away so as to be unfit for the butcher.

Among the Bastard Cows, some yield an oily and creamy milk; others but a serous milk: some give a great deal; others but little. In them, as in the genuine Cow of the same classes, the yield varies with the size; and the color of the dandruf is the same.

Generally speaking, the flow of milk is at its maximum during the first eight days after calving; but the milk is of a bad quality. After this period it undergoes a slight diminution; but its flow being once regularly established, the quantity remains constant until the Cow has conceived anew. At this period, it undergoes another diminution, in all the Classes and Orders; but more or less according to the Class and Order. We are now to enter into a more particular explanation of this.

CLASS I.

The Flanders Cow.

The reader is already apprised that, in the denominations which have suggested themselves to me, he is not to expect etymological or scientific combinations. The names which I have given to my classes are altogether arbitrary, and have reference to my own notions solely. I have adopted the above appellation for the Cows of my first class, which are the best in our country, because Cows of the Flemish breed, extensively known for their valuable qualities, possess, generally speaking, the escutcheon which is characteristic of this first class. These Cows, which I call the *Flanders* Cows, are the best milkers; they are also, among us, the most scarce. In this class, as in all the others, each order is distinguished by a particular modification of the general mark or escutcheon of the class; and there is a corresponding difference in the yield of milk, in the proportions which I am about to specify.

With respect to *size*, I call a Cow *high* when she weighs from five to six hundred pounds; of *medium hight*, when she weighs from three to four hundred pounds; *low*, when she weighs from one to two hundred pounds.*

HIGH COW.... First Order.

Cows of the First Order of this class and this size yield, whilst at the hight of their flow, (that is to say, from the time of calving until they are got with calf again) *twenty litres*† of milk a day. After they have conceived anew, the quantity of milk diminishes little by little; but they continue to give milk until they are eight months gone with calf: indeed Cows of this order never go dry, if we choose to milk them all the time.

Cows of this Class and Order are known by their having a delicate udder, covered with a fine, downy hair growing upward from between the four teats. This downy growth extends upward, over the hinder part of the udder and the region above it, blending itself with a similar growth (of hair pointing upward) which, beginning on the legs, a little above the hock joint, covers the inner sur-

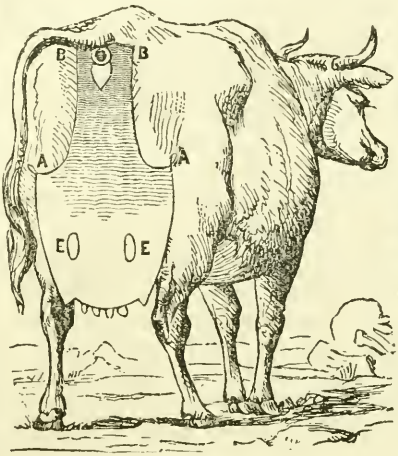
* This is French weight. To reduce it to English avoirdupois, add 8 pounds to every 100.

† The *litre* is one of the modern French measures, containing about 2¼ English wine pints

Table I.....Class 1.

THE FLANDERS COW.

Order 1st.



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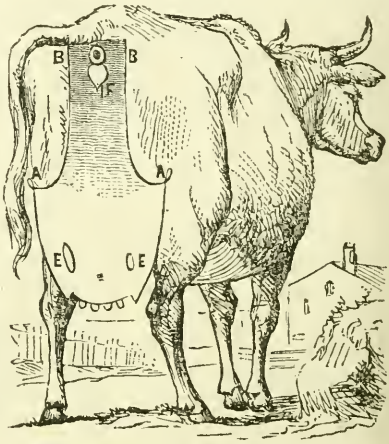

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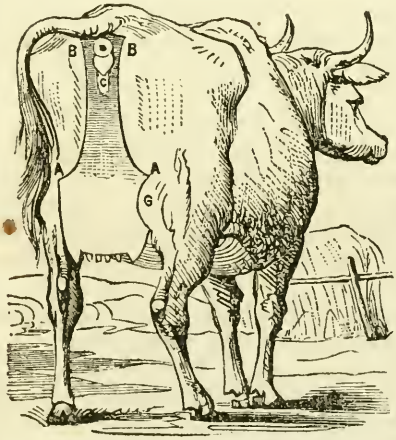

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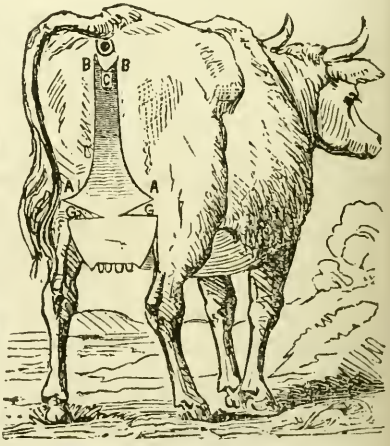
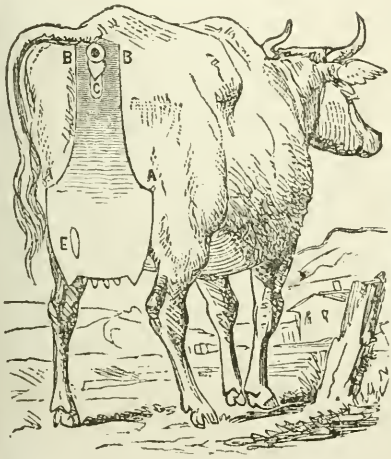


Table I.....Class 1.

THE FLANDERS COW.

Order 3d.



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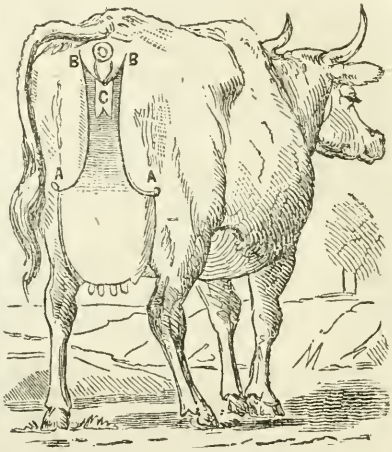
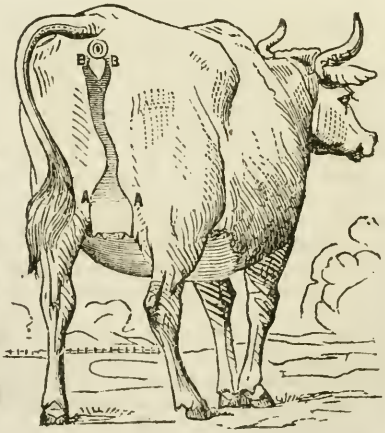


Order 7th.

Order 8th.



THE POTATO DISEASE.

AN AUTHENTIC AND VALUABLE MEMOIR ON THE POTATO DISEASE.

TRANSLATED FROM THE GERMAN, AND SENT BY THE TRANSLATOR TO BE PUBLISHED IN THE UNITED STATES.

THE following Essay was kindly presented for publication in the FARMERS' LIBRARY, by J. R. BARTLETT, Esq. of New-York. This paper, says Mr. B. is *a translation from the German.* The original was a REPORT by C. MORREN, Professor of Agriculture in the University of Liege.

The translation was made in Belgium, and at the author's request, *transmitted to the United States* for publication, and was received by one of the late steamers.

Various extracts from this Report have been published in the newspapers, both here and in Europe; but, as is often the case with extracts, the most important parts of the paper have been left out.

We have not been inattentive to the much that has been published on this subject in England, and if we have not permitted it to occupy more space in the Farmers' Library, it has been because these writers abroad have treated rather of the signs of the disease and of what could now be done to turn the diseased root to account, than of the cause of the malady, and the means of preventing it.

The first thing to be noted is, that while British writers ascribe the cause to atmospheric influence, or rather to the cold and variable summer in Europe, we have had an uncommonly dry and hot season here, with the disease in many places as fully developed; and, moreover, they give directions which fully admit the existence of the fungus. In their early Report, they decry the use of salt, as accelerating the disease, and yet they more recently recommend the use of it to stay its ravages. It is to be noted that Professor LINDLEY had committed himself in the Gardener's Chronicle, in an early period of the discussion, in favor of *atmospheric influence.*

Three instances have been lately published in the *New-England Farmer*, where, in parallel circumstances, *lime* and *salt* have saved that portion of the crop dressed with them, while the rest of it perished.

We know of no one who has so carefully studied this subject, with equal facilities and capacity to investigate it thoroughly, as that accomplished agricultural chemist and horticulturist, J. E. TESCHEMACHER, Esq. of Boston, who has satisfied himself that *fungus* is the cause of the disease. Several letters, as we understand, have been received by him from England, stating that those who could not find the minute fungus with common microscopes, and hence doubted its existence, have since clearly distinguished it by the use of instruments of higher powers, and are convinced of its existence being the cause of the disease. LIEBIG's expositions are purely chemical, and may just as well apply to the juice of the vegetable fungus, as to the juice of the vegetable potato. In Mr. Teschemacher's letter to the "New-England Farmer," Oct. 1844, he stated that the grains of starch were *uninjured* by the fungus. This, in 1845, was made a *great* discovery by Mr. Herapath, in England. In a few numbers subsequent, but in 1844, of same paper, Mr. T. states that, in all probability, the spores attached themselves to the potato-stalk, and so passed down to the tuber; and we have understood that, in his paper to the New-York State Agricultural Society, in 1844—which, it is to be lamented, has never seen the light—he states that before the microscope the appearance does not agree with the fungus *Erysibe*, the cause of the potato scab. MORREN says it is a *Botrydis*—in which, doubtless, he is right. In the same paper, as we have been told, Mr. T. enumerates sulphate of copper, as well as salt and lime, as preventives. So does M. Morren. In the same paper, and in the "New-England Farmer," Mr. Teschemacher advocates analyses of the juices of various potatoes, to see if anything can be found which, in one kind of juice, will be found less favorable to the vegetation of the fungus than in another—with the view of introducing salt *(chlorine of sodium)* into these juices, through the absorption of the roots, by spreading it on the ground. This is the chemical part of the subject. We recapitulate these facts for the rightful and legitimate purpose of showing that, by a public spirited and enlightened study of the subject, in 1844, Mr. Teschemacher, of Boston, had made and promulgated the same views which, in 1845, were taken by the scientific men in Europe; and which concurring testimony seems to confirm, and to give solid ground for recommending the application

of salt and lime to the soil, as well as to the potato itself. Those who, in the zeal of the true naturalist, make such laborious and pains-taking investigations for the benefit of society, may be, like Mr. T., indifferent to the credit of first discovery, which, to say the least, is their fair reward: but that only enhances the obligation of the impartial friends of Science everywhere to see that "justice be done, though the heavens fall."

Those most conversant with this subject, with whom we have conversed, are of opinion that potatoes should now be sprinkled with lime, and again when they are planted. Salt, they think, too, should also be applied to the soil. A gentleman near Boston planted five acres without manure, and one acre with *guano*. The seed all came from "down East," but from different places. The five acres are destroyed by the disease—the one acre is safe. Yet this experiment is not *absolutely* decisive—since, as the seed came from various places, it might be that those planted on the five acres were diseased, and the other not; but that is not probable.

The reader will observe that, throughout M. Morren's paper, he does not express any *doubt*, but says it *is* thus and so; and, from his character and the station he fills, we may be assured that he would not stake his reputation on any matter of fact of which he did not feel certain.—How can it, on reflection, be owing to atmospheric influences, since the disease has propagated under very various states thereof? At the same time, a moist atmosphere is known to be favorable to the growth of most *fungi*. But where no spores exist, it is believed no atmosphere can produce them.

It is a gratifying evidence of the earnestness with which the friends of Agriculture are pushing their inquiries, and enlightening its path with the lights of Science, that the Maryland Agricultural Club has committed this subject to the scrutiny of competent investigators.

It would seem by the following, from a late London Gardener's Chronicle, that the disease is prevalent, and believed not to be new, in its indigenous regions of South America:

"POTATO DISEASE IN CENTRAL AMERICA.—At the Academy of Sciences of Paris, Nov. 17, 1845, Monsieur Boussingault communicated an extract from a letter from M. Joachim Acosta, of Bogota, relative to the Potato disease. It appears from this letter that the malady is very common on the table land of Bogota, that it is destructive in wet seasons, or even every year in damp spots. This does not prevent the tubers being used, when the affected part has been removed. It is known that Potatoes are indigenous to this plain. M. Acosta does not doubt that the malady has always been known there, since it excites no alarm in the Indians, who live principally on Potatoes. M. Boussingault properly remarks that in these countries, where cultivation continues without intermission during the year, and where the tubers are consumed without the necessity of storing them, there is no fear, as with us, of a bad harvest, because it may be replaced immediately by a good one. With us, where the culture is annual, and must be preserved through winter, it is natural that we should be more concerned in a malady which may destroy the resources of a whole year.—*M. J. B.*"

So much by way of introduction to the valuable memoir from Professor MORREN—for which we return, in advance, the thanks of the agricultural community to the gentleman who has had the kindness to communicate it for publication in this journal.

POTATO SICKNESS.

IT is known that a general malady has stricken the Potatoes in Belgium, and it appears that the crop of this most necessary production is there much compromised. As it is said that this malady threatens also the Potato crop in France, we believe it right to reproduce here the advice that Mr. Morren, Professor of Agriculture at the University of Liege, has addressed to the public in a letter that we find in "The Independance," of Brussels. Mr. Morren, after stating that this evil has for several years existed in Belgium, although in a less alarming degree, adds:

"The true cause of the evil is a mushroom, a mouldiness, that the learned will class in their genus 'botrydis,' but that the agriculturists hardly distinguish, and which they call a burn, a fire, a stain, and which some attribute to humidity, others to dryness; some to a bad wind come from France, others to insects, &c. &c. It is not, however, indifferent to us to know the true cause of the phenomenon, for this knowledge will put us in the way of diminishing the scourge, and possibly of destroying it.

"For some time I have followed every day, and step by step, the progress of the evil, in observing several fields of Potatoes. The malady commences decidedly in the upper part of the leaves; I have even seen the flowers and fruits attacked in the first place. A part of the green tissue loses its tint and turns promptly yellow; the stain soon becomes more grey below, and it is always on the lower surface of the leaf, or on the fruit, where, a day or two after the appearance of the yellow stain, a whitish down shows itself. The microscope discovers then that this down proceeds from a mushroom which grows between the numerous hairs which garnish the bottom of the leaf of the Potato. This mushroom is of an extreme tenacity; but it breeds and reproduces itself by thousands. Its stems are formed of little straight and partitioned threads, which have at their summit one or several branches, always divided in two, and at the end of these branches reproducing bodies

develop themselves which have the form of eggs, but which have not more than the hundredth part, or even less, of a millimeter in size. I may be told it is a very small body to commit ravages so great; but I answer, the itch is not the less to be feared because the animalcule which produces it is a microscopic being.

"After the formation of the yellow spot, and the development of the 'botrydis' on the leaf of the Potato, the stem receives the deleterious influences. Here and there its surface becomes brown, blackens, and when the phases of the evil are followed with the microscope, it is soon perceived that the stem is attacked through the bark. The morbid agent carries its action from the bark to the skin, and although this does not always offer mushrooms, it is not the less stricken with death; for to any one that has some notions of vegetable physiology these effects easily explain themselves. The sap modified into living juice, into vegetable blood, forms itself in the leaf, and then descends into the stem and the root, by the bark. Here this sap is sick, modified, it carries the poison of the leaf into the stem, and this perishes. Indeed, so soon as the black spots declare themselves on the stems the leaves become dry and die—blackened and stricken with death by a venomous mushroom, they fall, unfortunately, to propagate the source of the scourge, or to deposit its germ in the earth. I will soon indicate the means which should be taken, to prevent this fatal communication.

"The infection soon descends into the tubercle itself. If the evil follows its course, the tubercle immediately gangrenes. A Potato is not a root, but a branch; it follows from that, that a tubercle possesses a marrow which is the eatable part to be preferred, and a distinct bark. Between the marrow and the bark is found a zone of vessels which represents wood. One can easily understand this structure by cutting a thin slice of Potato and placing it between the eye and the light. Now the infection attacks the part which receives the descending sap, that part where the morbid agent has itself descended. Upon a Potato attacked, one perceives a series of livid spots, brown or yellow, sometimes grey or blackened—a series which extends itself throughout the woody zone. In following the progress of the evil over a great number of spoiled tubercles, I could see how the disease, increasing by small degrees, finishes by reaching the heart itself of the Potato, and corrupts it entirely. The skin of the sick Potato easily detaches itself; the flesh no longer cracks under the knife; a discolored flacidity, a fade, and, later, an animal smell, analogous to that of mushroom freshly cut, declares itself and carries off the heart. The animals even refuse to eat a food which may be regarded to be quite as injurious as deteriorated mushrooms themselves.

"So soon as the Potato is gangrened within, that is, in its cortical part, but a few days, three at the most, are sufficient for the mushroom (the 'botrydis') to show itself without. This white efflorescence is seen to declare itself in the eyes of the tubercles, and then extend itself like light, white flakes, at first upon a rounded surface, but which finishes by invading the whole tubercle. The Potato is then entirely lost.

"The source of the evil being known, all the attention of the cultivator should be directed toward the destruction of the mushroom; for it is unfortunately too true that the blight, the rust, and all the race of parasites once introduced into the country, they remain there and propagate themselves. This year the epidemic has been general; every where the germs of it exist; millions of that which propagate it, if their number be not diminished, will attack the plants the approaching year, and it will then be more difficult than ever to eradicate the plague, to do which it is essential to adopt the following means:

"1st. When the leaves are lost they must be collected as quickly as possible, and burnt upon the spot, without being transported to a distance. The ashes may be spread upon the soil. In collecting them they must be shaken as little as possible. I have seen, with regret, the farmers collect the sick leaves to preserve them in a pile in the field, or to cast them over the hedges. This is to preserve the plague for the next year.

"2d. When certain varieties of the Potato, or certain localities are free from the calamity at the time of the crop, it is always prudent to burn the leaves; for a field may appear clear of the 'botrydis' when it is not so. Several leaves are attacked; these leaves throw out the seeds of the disease upon the tubercles, which, preserved as seed will preserve the disease the next year.

"3d. If the tubercles are themselves attacked, it is essential to take them out of the earth to make a prompt choice out of them, which is easy, for habit soon enables one to recognize the spoiled tubercles from those which are not so. The sound tubercles ought to be used as soon as possible, for they are not injurious up to the moment the bark becomes yellow. The smell alone is sufficient to detect the development of the malady. The sick tubercles should be burned.

"4th. To obviate the sorrowful consequences of a crop which will be always reduced either a half, or a third, or even less, than an ordinary crop, it would be important to follow, in our country, the method practiced in Scotland in cultivating Potatoes during winter.

"5th. Since it is very probable that the seed-tubercles that may escape from the present crop will be infected with the germ of the mushroom, it would be well if by the intervention of the Government or commerce the farmers had at their disposal pure seed-tubercles, that were not infected; and for this purpose, the Potatoes of Pennsylvania or Ireland would suit us exceedingly well. The plague is not known in those two countries. We must distrust the Potatoes of Germany, where the dry gangrene, the shriveling (*la crispure*) and the ulceration of the tubercle is but too common; and we might take advantage of this importation to endow the country with those varieties of Potatoes which are most congenial to our soil.

"6th. If the farmers are obstinate in employing, as seed, tubercles of this year's crop, it will be necessary to subject them to liming, as is done with wheat, rye, oats, and all plants which are subject to be invaded by parasites. The liming ought to be done by immersing the tubercles, because the study of the habits of the 'botrydis' shows it is the eye, the deepest point of the Potato, which is attacked. The limed water should then bathe this leprous eye. 25 kilog. of lime, ¼ lb. of the sulphate of copper, and 3 kilog. of marine salt, to 125 litres of water, constitute a liming of which the useful effects have been acknowledged by a great number of instructed cultivators.

"7th. In the plantations, either of the winter of 1845 or the spring of 1846, it is essential to plant, in Potatoes, parcels of ground as distant as possible from those infected this year, for it is easily understood that the chance of transmission, by the preservation, in the soil, of the seed of the mushroom, is much greater in plantings that approach each other than if they were made at a distance.

"8th. When the Counselor de Martens visited Belgium, and inquired in our different provinces the state of our Potatoes, he informed me, in one of his interesting conversations, that the farmers on the borders of the Rhine had remarked that the dry gangrene attacked oftener the Potato plantations made in the afternoon, than those made in the morning; and he explained this phenomenon, which at first appeared singular, by a very simple fact. When the sun has passed the meridian, the heat of the strata of air is at its maximum: this heat accelerates the vitality of plants; that which propagates them flies more rapidly in a dilated air; the insects, in their flight, disperse with facility a mass of little bodies, of which the air is the vehicle; and the dissemination of their germs is then also at its maximum. The farmer is plunged in this atmosphere, and he causes to pass through it the Potatoes which he plants; it attaches itself to the seed, and is sown with it; and that happens here which occurs to the grain not limed—the poison is sown and grows with the plant, to attack and kill it at a later period. From which arises the advice we give to the farmers, to plant their Potatoes in the morning.

"9th. The employment of lime and marine salt, mixed with a small quantity of the sulphate of copper, is, as I have said, of a recognized efficacy in the destruction of the germs of parasite plants; consequently, to powder with these mixed substances the soil which has been planted with sick Potatoes, is an operation calculated to destroy the germ of the scourge, and cannot be too strongly recommended everywhere.

"10th. The preservation of the Potatoes that have escaped being attacked this year, in cellars, &c. will certainly deposit in these places the germ of the mushroom. To cleanse these cellars and whitewash them with lime are excellent means of destroying the germs, and to spread lime and pounded coal on the places where the Potatoes have been deposited, will finish the series of proceedings we consider the most rational and the most certain to destroy, if it be possible, the evil at its root.

[Signed] "CH. MORREN,

"Member of the Royal Academy of Sciences, and Professor of Agriculture and Economy 'forestiere' at the University of Liege."

Since the receipt of the above we have been favored with a copy of the following. To the American readers of this journal it is superfluous to say that Mr. Gowen's zeal, intelligence, close attention and success as a practical farmer, entitle his judgment to high respect, and well account for the British Consul's application to him for the result of his observations on this important subject.

Correspondence between Mr. PETER, *British Consul at Philadelphia, and Mr.* GOWEN, *of Mount Airy, on the subject of the Potato Rot.*

MR. GOWEN'S REPLY.

MT. AIRY, 29th Dec. 1845.

My Dear Sir: Your note on the subject of "the Potato Rot," dated Saturday, did not reach me at Mount Airy, Sunday intervening, till this morning, Monday. It would give me pleasure to oblige you fully in this matter, did time permit to go more into detail; but the brief space allotted for a reply will compel me to be as concise as possible.

I hold that atmospheric influence is the sole cause of the late pervading Rot in the Potato; that neither manures nor condition of soils could have produced the calamity; that animalculæ and fungi are as remote from it—the latter may in a partial manner injure a Potato plant, as they would, under peculiar circumstances, be likely to injure other plants; that the Rot *is not* epidemic; and have reason to believe that sound or *partially* sound Potatoes, taken from

a diseased crop or heap, will, if planted, produce healthy, sound Potatoes in the absence of the cause which injured them the previous season.

I would therefore encourage the farmers to cultivate their Potatoes as formerly, choosing the soils and applying the manures which hitherto were found best adapted to their culture; forgetting or overlooking the Rot altogether, and disregarding the nostrums recommended for its prevention: the Potato won't bear doctoring.

The weather which produces Rot is either a severe, continuous drouth of some weeks' standing, thereby preventing the natural growth and maturity of the Potato, for the want of moisture, or very hot weather, bringing the Potato to a premature ripeness, succeeded by wet, sultry weather, unnaturally *spring-like*, which provokes the tubers to perform the functions of seed, thereby dissolving the connection between them and their vines: the vines die; the roots undergo an incipient fermentation preparatory to decomposition; the operation of budding or growing is checked by the natural autumnal temperature that at length prevails, which arrests the Potato in its work of producing, and hence its deterioration. The latter condition of the weather is the prevailing cause of the Rot.

As to a severe and continuous drouth, my own experience points to that of 1838. That season I had a five-acre patch in with Potatoes, which did not pay for the trouble of taking them out of the ground. They were small, ill-shaped, bad-tasted, poisonous, spotted and black-hearted, and rotted in cellar. Potatoes that season sold as high as $1 25 and $1 50 per bushel—not a bushel of good Potatoes in March, except those imported. Then as to dry, hot weather, succeeded by wet, close, over spring-like temperature, the season of 1843 is in point. I took more than common pains that year to produce a surpassing yield, equal, at least, to my famous crop of the preceding year, which was over 440 bushels to the acre—field culture. My seed was in part from those fine Potatoes, and in part from some very large, sound Potatoes imported from the State of Maine. On taking out the crop in October, the whole was found to be very badly diseased. The weather from the latter part of June till the beginning of September was mainly hot, occasionally very hot, and dry. September set in with warm rains, thunder-storms and gusts; the moisture and closeness unprecedented; fruit-trees blossomed, as well as many flowering-trees and shrubs; I recollect making a large collection of flowers from the magnolias, some of which I sent to the Editor of the "Pennsylvania Inquirer." My Potato vines looked green and healthy, when all of a sudden they changed color, drooped and died. I think if I had taken out the Potatoes at that juncture they would have proved comparatively good; but they were permitted to remain quite a month after, when they were found badly rotted, tainted, and almost worthless.

Now, then, as to the epidemic. In 1844, I planted some four to five acres of Potatoes, *the seed of which was principally culled from the diseased crop of* 1843. I planted, also, at the same time, in the same field, other seed of very sound potatoes brought from Maine; they all did equally well; I *could discover no difference*; the crop was a very fair one, and the quality unexceptionable in every respect. I do not mean by this to encourage the planting of diseased or doubtful Potatoes. It is safer to plant sound and perfect ones; but I am strong in the opinion that there is no danger of a diseased or tainted Potato producing a diseased or tainted Potato. It may, from its want of vitality, be very unproductive, make feeble shoots, the same as decayed Potatoes from on shipboard after a long voyage, the heat and moisture of the vessel's hold having caused them to send out enormous shoots, impairing their vigor, and producing Rot. Such Potatoes, when planted, never produce well as to size and quantity; but I have yet to learn that they ever produced a diseased Potato.

Much has been said of Potatoes becoming feeble and sickly from long and constant planting: there may be something in this; time will not permit me to examine it now. I have, however, numerous sorts of seedlings produced from the apples of my very fine crop of 1842. I shall take occasion to present you with a few to send to some of your friends abroad.

By this you will see that I can offer no remedy or preventive for the Rot. He that tempers the winds to the shorn lamb, can only control it. Should it again visit us, we can only exercise our best judgment by taking out the Potatoes early—as soon as they exhibit signs of decay—laying them in thin layers in dry, cool situations, or otherwise, as circumstances may justify. Let the farmers go on and plant in confidence, as their best experience may teach, trusting for an abundant yield to that Providence who sendeth the early and the latter rain.

Very respectfully your friend and ob't serv't.
(signed) JAMES GOWEN.

WILLIAM PETER, Esq. Her Britannic Majesty's Consul, Philadelphia.

COLORED INKS.—Inks of various colors may be made from a strong decoction of the ingredients used in dyeing, mixed with a little alum and gum arabic. Any of the ordinary water-color cakes employed in drawing, diffused through water, may also be used for colored inks. [Cooley's Cyclo. of Prac. Receipts.

CHARACTERISTICS OF DIFFERENT BREEDS OF HORSES, BY HON. ZADOCK PRATT.

FARMERS RECOMMENDED TO KEEP EXACT ACCOUNTS.

PRATTSVILLE, GREENE CO., N. Y., HORSES AND PENNSYLVANIA CONESTOGAS COMPARED.

We do not know when we have seen the characteristics of Horses for different purposes more briefly and at the same time comprehensively and accurately described than by Hon. Zadock Pratt, in the following extracts from his address lately delivered to the Greene County Agricultural Society of which he is the President. But it is not so much to commend these extracts in that light, as to make them answer another purpose, that we have cut them out of the midst of a variety of topics, presented by this address with the force of truth and the plainness that belongs to and best becomes *the working man*.

The point to which we would particularly call the attention of the young Farmer, is the ease and the confidence with which he states the *exact cost per hundred* of transporting nearly two and a half millions of pounds of leather! What an example here is of *system*. How forcibly it illustrates what we have so often inculcated—the *propriety of keeping exact accounts of every cent of outlay and income on a Farm*. Let it not be said that to do so, would be difficult and troublesome if not impossible. To the slothful and indolent all things are difficult; a lion is always standing in their path. So Mr. Pratt might have said the same, but had he *acted* upon that principle, how different might have been the result even of his life of personal industry! Instead of ample independence, and the power and the *will* to be useful to his fellow men and his country; he might, *without system and without accounts*, have closed a career of care and toil, in penury and wretchedness.—Without them his business might have sprung aleak in divers places only to be discovered when his bark was in a sinking condition! Instead of that, every item, from the purchase of the raw hide to the sale of the perfect leather is noted, and posted up, as accurately and minutely as in the most systematic mercantile establishment. If a screw gets loose in his business, it is at once discovered and put right, and why should not every farmer keep, substantially at least, a full *view of profit and loss!* Why should he not be able to tell how much a bushel of wheat or a pound of tobacco costs, as well as Mr. Pratt can tell the cost of a single pound of leather—ay, even to a cent—how much to haul it, though that be done, as the farmer's wheat is transported, with his own wagon and team! For, after all, a farm is no less a manufactory than a tannery is! The tanner puts in his land, his buildings, his vat, his hides, his bark-mill, his bark, his horses; then the cost of their food, the smith's work, his hired labor, and all *that is outlaid*, until the *leather is sold and the balance struck*. The farmer has in like manner a certain amount of capital inherited or invested (for it is the same thing as a matter of account) in lands, horses, hands, lime, plaster, seed, manure, expense of subsisting his force, cost and wear and tear of machinery, implements, horses, mules, oxen—and all that is employed in *manufacturing* hay, or grain, or tobacco, or rice, or cotton, or sugar, or hops or apples, or hemp, until at last *the produce or manufacture, like the leather, is sold, and the balance struck!* Why then are not accounts as necessary to the farmer or the planter, as to Zadock Pratt and Company? who, if you were to tell them they were not to *keep accounts*, however flattering of profit the chances might seem to be, would not venture to proceed for a *single day!* But, keeping exact accounts, watching for leaks, and working by a system that cannot fail to detect them as soon as they occur, behold the result! His sagacity discovers a manufacturing water-power which had slumbered for ages, unobserved and neglected, in the solitude of Nature, like granite in the yet unopened quarry. With confident forecast he takes hold of it and wakes the sleeping giant into action, taking care to have him well harnessed and under control, as the Gaucho seizes and tames the wildest horse of the pampas. Driving that power with industry and exactness, it has grown into a manufactory that has no equal of its kind—the nucleus of a thriving and prosperous and moral community. But this could never have been done, by industry alone, without system, and that security which system only can give. Of this large establishment, a model in its way, for the benefit of the rising generation, we may hereafter give a more particular account.

These are the sort of men who multiply the products of labor by offering rewards to industry, and who incite others to the practice of systematic diligence by their own successful example. Such men are of more real advantage to their country than an army—of idle blood-suckers and intriguing, selfish demagogues.

Of all the animals created for the use of man,

none has been the subject of so much observation and esteem as the Horse. In their native wilds, Nature forms them into herds and groups, and gives them in command of the strongest and fleetest; and by this and other wise arrangements, of which only God is capable, guards the species against general degeneracy. The same kind care has been shown in special provision for the security of every race of animals; but when this security is taken away, and they are brought under the dominion and management of man, the most skillful attention is required in changing the general character of the species, and producing and improving distinct breeds, each adapted to its own specific purpose. It is not every breed that is suited to every locality; for climate and the face and food of different countries will modify the shapes and qualities, not only of the domestic animals, but of the human species: the raw-boned, industrious, hardy and temperate man of the north becomes enervated and indolent both in the mental and physical constitution and energies, in tropical latitudes where he reposes in the lap of luxury, enjoying without exertion the abundance which Nature lavishes around him.

"The horse best fitted to travel in the sun and sands of the south, is the descendant of the small, hard-boned, light-footed Arabian, with his high courage and silken coat; while grain-growing Pennsylvania and Ohio, with their cumbrous wagons, prefer to use a heavy, corn-fed breed, that will throw a greater weight upon the collar. The north, again, is better served by a more compact and active race, of middle size, endowed with much more strength in proportion to their weight, and greater powers of endurance; who bravely champ the bit and nobly strain to the load with lion-like vigor; rejoicing at toil, and answering to the driver's voice with proud step and martial air, as if it was the trumpet calling them to battle. Thus the wants and peculiarities—the soil, climate and uses of each district—require and produce that peculiar breed which is best suited to itself. What better stock do we need than such as can be bred from the best of those we already have. The teams of Z. Pratt & Co. composed of a single span (natives of our own region), are in the habit of drawing from Catskill, over the mountains to Prattsville, and back, loads of hides and leather of from thirty to fifty, and even sixty hundred weight, each wagon or sleigh not included, the distance being thirty-seven miles, and requiring three days to go and come.

"The quantity thus transported within the year is nearly two and a half millions of pounds, and the expenses the last season, including all risks and charges, was only thirteen cents a hundred. During twenty years of this service, which I make bold to assert has not been equaled by horses of any other district or county on the globe, not a horse has been injured, in the hands of a careful driver, and to the honor of the county be it said that we have never lost a hide or side of leather, of the million and one-half thus transported."

The reader may be gratified in having the means of comparing these *Prattsville, Greene Co. New-York* Horses with the *Pennsylvania Conestogas*. It will be seen that two of the former haul from five to six thousand weight—twenty-four miles a day, while six of the latter make but sixteen miles a day with from six to eight thousand. Doubtless, however, the wagons in the latter case are much heavier, and the roads not nearly so good. But the reader must make his own comparison. The following is a letter from DAVID AGNEW, Esq. the excellent Postmaster of Wheeling, in reply to a letter from Mr. SKINNER, then Assistant Postmaster General. We find it in one of the works edited by Mr. S. for LEA & BLANCHARD of Philadelphia, in an ESSAY ON THE USE OF OXEN, incorporated in the American edition of "CLATER AND YOUATT'S CATTLE DOCTOR, by SKINNER:"

WHEELING, Nov. 23d, 1843.

J. S. SKINNER, Esq.

Dear Sir: Your favor requesting me to obtain information respecting horses, wagons, &c. was received in due course of mail; but as I was just leaving for Pittsburgh, I was compelled to defer answering until my return. I conferred with several wagoners, and give below the result of their united opinions.

Respectfully, your ob't serv't, DAVID AGNEW.

Question. The usual average daily travel of loaded wagons?

Answer. Sixteen miles.

Q. How many horses, and their average cost or value?

A. Six horses, average cost of each $65.

Q. The average time that horses so employed will last?

A. Seven years.

Q. At what age is it considered safe to put them to such labor?

A. Five years. Many are used at three or four years.

Q. What the average cost of shoeing each horse per annum?

A. Fifteen dollars.

Q. What is the usual feed of kind and quantity, and to how many oats is it equivalent where oats are not used?

A. Oats is the only feed in use. Four and a half bushels is allowed per day for six horses.

Q. As to hay—is it in regular use on the road, or does cut straw, or what, take the place of it?

A. Cut straw is not used. Hay is in regular use.

Q. What is the *usual* weight of their load exclusive of their wagons, and what the weight of the wagons?

A. The weight of loads varies from sixty to eighty hundred pounds; seventy hundred pounds is the usual weight; wagon's weight about 3,500 lbs.

Q. What is the first cost of wagon, harness per horse, and how long will a set of harness last?

A. A wagon of the largest size used on the national road costs $250; harness per horse $20; and will last six years.

Q. What is the cost of a wagon in proportion to what it will carry—and about how long will a wagon last, with ordinary care?

A. A wagon that will carry 3,000 lbs. costs $150; 4,000 lbs. $160; 5,000 lbs. $175; 6,000 lbs. $200; 7,000 lbs. and upward, $250; and with ordinary care will last four years.

PRESERVATION OF CABBAGES.—Cut them so that they may have about two inches of stem left below the leaves, scoop out the pith as far down as a small knife will reach, then suspend them, by means of a cord, exactly perpendicular, but in an inverted position, and daily fill up the hollow part of the stem with clean, cold water. It is stated, that by this method, cabbages, cauliflowers, broccoli, celery, &c. may be preserved for some time in a cool place; it affords an easy means of keeping a supply of green vegetables during a severe winter.

[Cooley's Cyclopædia of Practical Receipts.

ON FATTENING CATTLE,

AND THE FORMATION OF FARMERS' CLUBS.

CAN we too often urge the formation, in every Election District of the country, of *Farmers' Clubs*, for the discussion of questions of all sorts, even political questions, *immediately and obviously connected with the spread of agricultural knowledge*, and the advancement of agricultural prosperity? How easy it has ever been found when the political huckster has desired to get up an excitement, most generally with some sinister design covered by the avowal of a public purpose, to bring his clansmen around him, at some X roads tavern, to be slang-whanged. For *this* purpose, he has but to sound his whistle; alas, not the spirit-stirring whistle of *Rhoderick Dhu*—at sound of which

> "The rushes and the willow wand
> Are bristling into ax and brand,
> And every tuft of brand gives life
> To plaided warrior, arm'd for strife."

No! no! his resembles rather the insidious call of the shepherd, whose flock, gathering around him in hope of being fed, are flattered into the fold and sheared, and then turned loose again until another crop of wool has time to grow and be sheared again. Thus are good, easy Farmers gathered under the banner of party to appoint their *patriot leader* to the Legislature or to Congress, or to recommend him to some Executive office, and all this in abject compliance with the "*usages of the party.*"

We are characterizing no particular faction, but, more in sorrow than in anger, adverting to the easy excitability of the agricultural community, in matters of party politics, and the great difficulty of bringing them together for any *peculiar concern of their own*, as *Farmers*, and the extreme reluctance and parsimony with which they can bring themselves to give either time or money for the discussion of agricultural questions, the dissemination of agricultural knowledge, and for devising the ways and means of controlling and shaping the legislation of the State and the Country, for the protection and benefit of the *landed interest*. We have known farmers and planters who would cheerfully give a fat sheep or bullock, or a barrel of whisky or of flour, for a *partisan "treat,"* who would not give $5 a year for 1200 pages of the most valuable information to be gathered in reference to their own business, from the experience and teachings of the best farmers, and the ablest men to be found, in all parts of the world! And yet there are men who will tell you that they wish their sons to be honorably distinguished for intelligence, and to keep pace, themselves, with the progress, experience and discovery, in every thing connected with their own business and sphere in life!

We know not how we could give a better idea of the utility of these Farmers' Clubs, and of the useful designs which animate and so well become them; than by copying, from the last November number of the London *Monthly Magazine*, the following account of a meeting of the "LOUGHBOROUGH AGRICULTURAL ASSOCIATION." The problem for discussion was *The Fattening of Cattle*. We transfer to our columns the observations of the several speakers, the more readily, as they seem to answer, in part at least, an inquiry lately made of us by MAJOR GWINN, the enterprising contractor for the completion of the Chesapeake and Ohio Canal, who has large possessions in the fine "glades" of Allegany County, Maryland; a region so admirably adapted to the growth of *oats and potatoes*, and replete with advantages for grazing and for sheep and dairy husbandry more eminent and less known than almost any equally eligible portion of our country. Major Gwinn's inquiries were, as to the adaptation of the crops congenial to that elevated region, to the *Fattening of Cattle and Sheep*.

True, it may be said, and by some objected, that these are *English* discussions; but the substances referred to, and the principles evolved, are of no particular nation or clime; they are of universal use and application, and in Heaven's name let us go, for knowledge, to Kamschatka or the moon, if not elsewhere to be had.

It requires but half a dozen in any county or neighborhood to form the nucleus of such a club. If the right spirit exists, it will soon be sufficiently numerous, and if it does not exist, it may be easily infused.

One thing is to be guarded against—the *cacoethes loquendi*. Too great a disposition to twaddle and to have the last word! When questions are given out, the chairman should allow no rambling from the subject in hand. One thing at a time—and for the sake of uniformity and consistency in the manner of conducting these meetings, it would be better to have a standing permanent chairman, chosen with strict reference to *his tact for the duty*,—quali-

fied by a happy union of courtesy and firmness, to maintain order, and bring back rambling debaters to the order of the day. There is nothing useful gained by picking up, at random, this gentleman or that, strangers, who happen to come in, and making them chairmen, merely for the sake of making a hit, or a sensation in the papers. But to return.

One fact alone, repeatedly stated, and universally acquiesced in, at this Loughborough meeting, would repay the time taken up in the perusal of its proceedings, if, happily, it should prompt the reading farmer, to act upon the testimony we there find, again, in favor of *protecting domestic animals from too much exposure to cold.* It is broadly asserted that the warmer they are kept, the less food they require to keep them in a certain condition. It is there shown, also, that food for fattening animals, goes farther when given of a temperature near the natural temperature of their own bodies, which is nearly 100 degrees. Here, too, we see it stated as an established fact that the *exclusion of light* favors the fattening process. All these things are essential, not only as matters of information with which every accomplished farmer should be acquainted, but as matters of practical economy in the management of his estate.—We will suppose too, for example, to carry this matter a little farther, that a gentleman farmer near Washington, is dining, we will say, with the President or the Mayor of the City, in company with his Excellency the Minister from Holland, whom we happen to know to be of enlightened, inquisitive mind, as all Ministers should be, and the question were to come up about *cheese*—(which it must be allowed would be a very natural one about the time the Port makes its appearance,) though this gentleman farmer might not choose to boast over the Dutch Minister, that ours had driven *his country cheese* out of the English Market; yet the fact that it has done so being admitted, would it not be legitimate that the American farmer, proud of his calling, should take pride in the fact being so, and in being able to answer the question *why?* which is disclosed in this *English* discussion! Are not the substance of these proceedings, and the prize essay we have before published on the manufacture of Cheshire cheese, among the sorts of knowledge that every farmer, anxious for the intellectual culture of his son, would like him to possess—even as much, if not more, than to possess it himself? He that would not, cannot have the heart of a man, much less of a *parent.* Yet how is knowledge—that sort of knowledge which should not only be a part, but is fitted to be the most delightful part of rural life—to be obtained but by *inquiry,* by *reading,* and by association with companions and men, more informed than ourselves—a thing which every young man should study to do?

It is to beget and to satisfy this thirst for knowledge, and for that true glory which knowledge and virtue only can confer, that we are devoting all our poor abilities to the "FARMERS' LIBRARY AND MONTHLY JOURNAL OF AGRICULTURE;" and as we hope for success, we would so devote, if we could afford it, a portion of all of life that remains, without any remuneration but the pleasurable consciousness of having contributed something toward the moral and intellectual improvement of a pursuit, which in more senses than one has always *supported,* for it has always been *ridden* by, every other.

Loughborough Agricultural Association.

THE quarterly meeting of this Association was held in the Wellington room, at the Plow Inn, on Thursday, the 25th September. S. B. Wilde, Esq. presided; and Mr. J. N. H. Burrows occupied the vice-chair. After the cloth had been drawn, and the usual loyal toasts were given, as also the health of the President, Chas. Wm. Packe, Esq. M. P.—

The CHAIRMAN read the circular calling the meeting, in which it was announced that the subject of discussion was, "the fattening of cattle."

Mr. RAWSON, surgeon, of Kegworth, introduced the subject. He said, there were known to chemists about fifty-six elements, of which there were only eight or nine in animals; the principal of these were oxygen, hydrogen, nitrogen, and carbon. Oxygen enters into all animal and vegetable substances, and is an essential ingredient in atmospheric air. Nitrogen has no positive properties: its object is to dilute oxygen. No animal could live in nitrogen alone. Hydrogen is sixteen times lighter than common air, and is an essential ingredient in water, and very inflammable. After an elaborate description of the various elements which enter into the animal frame, the speaker proceeded to inform the meeting what were the various uses of each. Nitrogen, he said, was the principal ingredient in flesh and muscle. Fat is composed of carbon and hydrogen. If they wished to make an animal fat for sale, or for show, they must feed it on carbonaceous food. Unripe straw is very carbonaceous. As the seed ripens it becomes less so, and not so suitable for fattening. Cows generally feed well on aftermath. Half a pound of Swede turnips contains 110 grains of nutriment, while the same weight of white turnips only contains 85 grains. The outer temperature is very important; it should be brought as nearly as possible to the temperature of the blood. The same regard to temperature is necessary with respect to a milking cow. Fat is a mere deposit, a secretion; it does not impart strength, rather the contrary. Hence we do not make a horse fat for racing, but make him display muscular power. In fattening horses for sale, carbonaceous food, young grass, oil-cake, Swede turnips, &c. should be given. In feeding for use, the carbonaceous should be mixed with an equal quantity of other kind of food.

The CHAIRMAN next proposed "The health of Mr. Bernays," which was received with applause.

Mr. A. J. BERNAYS (analytical chemist, from

Derby then rose and said: Agriculture is a subject of such vital importance to the community at large, that I consider myself bound to attend all such meetings, where I may increase my knowledge of it; and I shall always be glad to be present at your quarterly meetings as long as I am in the neighborhood of Loughborough. We have just now heard that although 50 elements are at present known, yet only a small portion of them enter into the composition of animal and vegetable life. Of this portion, consisting of from 10 to 12, only four enter extensively into the formation of the organized portion of the vegetable and the animal. These elements arrange themselves into two distinct classes: the one class, formed by the combination of carbon, hydrogen and oxygen, in different proportions, includes what Liebig calls *the elements of respiration*. Hereto belong starch, fat, butter, sugar, gum, and alcoholic fluids. These may likewise be termed non-nitrogenized substances. The other class, formed by the combination of all the four elements, includes the *elements of nutrition*, or the *nitrogenized* constituents of food. Hereto belong vegetable and animal fibrine, caseine, albumen, and gluten. The non-nitrogenized constituents were provided for sustaining the animal heat of the body, and protecting its parts; and in so doing a provision is laid by, upon which Nature draws when the body is diseased. From their very nature they are easily destroyed by the influence of the oxygen of the air. You all know it to be a common practice to milk cows in the field, if they be at any distance from the homestead; the reason is obvious: when a cow walks a great distance without food, the oxygen of the air almost immediately begins to act upon those substances with which it can most easily combine. Such a substance is the butter in the milk: when a cow is driven home, the butter is found, in great part, to have disappeared. Again, after parturition, the milk of the cow contains only traces of butter; because, by the increased action of the muscles, a larger proportion of oxygen is taken into the system. This well known fact brings us to the subject of stall-feeding. When a cow is intended for milking, and with a view of yielding as much butter as possible, we naturally confine her. In this unnatural state, there being no call for exercise, the food taken by the animal is only in small part expended in maintaining its heat. However, we all know that confined milch cows never yielded so well-flavored butter or cheese as those which are unconfined. Cows living in a natural state eat what they *like*; stall-fed cows eat what they *get*. *Owing to this cause, the Dutch cheeses have nearly been driven out of our market by the American.* In Holland, stall-feeding is the common practice; hence is the produce less palatable than the American, in which country, land being cheaper, the practice is unnecessary. There can be no question about the utility of stall-feeding, but I very much question whether close confinement is equally beneficial with a confinement allowing of some gentle exercise. When the weather is warm, cattle may pasture in the meadows without loss to the agriculturist. *The air is then nearer the temperature of their own bodies, besides being more expanded.* The animals feel no call for exertion to keep themselves warm, and the gentle motion necessary in the seeking of food, by increasing the healthy state of the body, enables them not only to eat more, but to assimilate better what they do eat. In winter the case is materially altered. The temperature is far lower than that of their own bodies; the air, too, being more condensed, contains a proportionally larger quantity of oxygen. Therefore, more non-nitrogenized food will be required to combine with the excess of oxygen, indeed, as we all well know, more food will be required than in warm weather. Here the peculiar advantages of stall-feeding come to our aid. *You will perceive that warmth produces a saving in food; it is indeed an equivalent for food.* Every thing that cools the body of an animal, causes a proportionate *expenditure of food*. In stall feeding, the temperature of the air of the stalls should be equally maintained, and they should be kept clean. The animals should be regularly fed, have plentiful litter, and be kept clean. If, as we have already said, warmth is an equivalent for food, it is obvious that the form in which the food is given cannot be immaterial. The more we facilitate the adaptation of the food for the organs of digestion, the greater will be the saving to us. The farmer cuts up his hay, straw and turnips to save some expenditure of force, hence of food, by the feeding animal. If the food contain much water of a temperature far lower than that of the animal, it must be raised to that temperature at the expense of a part of the food. This is obviated by the process of steaming. An ox, fed by Earl Spencer, consumed in a winter month (the temperature of the air 32°), 60 lbs. of mangel-wurzel a day. Now, in order to raise the temperature of the water of the mangel-wurzel to the temperature of the body of the ox, no less than one-twentieth of the food was expended. All feeders of pigs know that they thrive better on dry than on wet fodder. Mr. B. sat down amidst great applause.

The CHAIRMAN then proposed "The healths of Mr. Stokes and of Mr. Allen," who made a few observations on the advantages of giving artificial food to animals in the straw yard. He had himself given oil-cake to cattle, and found it to remunerate him.

C. STOKES, Esq. rose to give his testimony to the principles laid down by Mr. Rawson and Mr. Bernays. He could fully bear out Mr. B.'s remarks on stall-feeding.

Mr. SMITH wanted to see science brought forward in connection with Agriculture. "We want," he said "something definite and distinct on the formation of fat and muscle." He wanted defined what would produce most fat, milk, and cheese; and he hoped to provoke one of the gentlemen present to rise and define it. He hoped they would give them the kind and quantity of food to produce them.

Mr. C. W. WOOD, surgeon, of Woodhouse Eaves, said he would direct the few remarks he had to make exclusively to the expressed object of the meeting, namely, the feeding of cattle; and he viewed that as the most important matter with which the practical farmer had to do; in short, his whole life and exertions tended only to produce the greatest possible quantity of beef and mutton—if not in the shape of fat cattle, his supply of grain only produced the same effects in man. But before we talk of producing, it is necessary to ascertain correctly what it is we want to produce. All animals are composed of bone, muscle, fat, cellular tissue, wool, hair, horns, skin, and nails, and we find these very substances ready formed in vegetables, the power of nutrition in the animal having

nothing to do but select them from its food, and by means of the circulation to place them where they are wanted. If your object be, as in the young growing animal, to increase as well as to sustain it, you choose those vegetables which contain a large proportion of muscular fibre, or nitrogen and phosphate of lime for the bones, such as peas, beans, oats, barley, &c. If, with a full grown animal, your object be to sustain its condition with an increase of fat, you give those vegetables which contain fat ready formed, as lentils, Indian corn, oil-cake, &c. But as you have generally a mixed object in view, namely, to produce bone, muscle, and fat also, you must necessarily give a mixed food—the operations of which I will now explain. The composition of the animal and the vegetable world is identically the same, and the latter, wherever we find it, contains in a greater or less degree all the elements of the former. The vegetable world is sustained entirely from inorganic nature, the earth on which we tread, and the atmosphere we breathe, occupying a middle sphere, its whole existence being to collect materials to build up the animal, consequently entirely subservient to it. The inorganic world, again, is composed of a few simple elements, of which hydrogen, oxygen, nitrogen, carbon, phosphorus, sulphur, and some saline substances, as potassium, sodium and calcine, form the chief, the very elements of vegetable and animal life. Geology, chemistry, physiology, are therefore essential to the right understanding of this subject, bearing ever in mind that the lower are always administering to the wants and necessities of the higher orders of creation. There is no motion in an animal body, or emotion of mind, but what causes a corresponding absorption of the tissues of the body, and in order to keep up this daily waste, a certain amount of food is necessary. This is called sustaining the body. Thus cattle working hard require a larger amount of food than when at rest. This necessity being duly attended to, constitutes health. But fattening, gentlemen, is an unnatural condition, and requires an increase of substance. Hence the necessity of unnatural means, as the absence of exercise, light, and the influences of the atmosphere, a mixed diet to bring out all the materials of the animal body to the greatest perfection) in a dry, warm state. *Mr. Childer's beautiful experiments proved that warmth alone with an animal would produce one-third more flesh, and at the expense of one-fourth less food. Mr. Norton also proved that the absence of light with warmth produced still greater results.* The reason of this is obvious. Every animal possesses both a nutritive and respiratory apparatus; the one to sustain the body, the other to support its vitality, by producing heat or warmth. This first object is effected by the gluten in the food principally, the basis of which is nitrogen. The second by the starch, sugar, and gum, contained in the food, which form bile, the basis of which is carbon. The bile passes into the intestines, where it meets with oxygen, and thus becomes carbonic acid. In this state it enters the circulation, where it meets with peroxide of iron (which the blood always contains), the carbon unites with the iron, and forms carbonate of iron. In this state it passes to the lungs, where it meets with fresh oxygen during inspiration, which re-converts the carbon in the carbonic acid, which passes off during expiration, while the peroxide of iron is reformed, and taken back by means of its carriers to be again transformed into carbonate. The result of this combustion of carbon is heat. The heat of the animal body is nearly 100 degrees: all food, therefore, before it can be assimilated must be raised to its own temperature, which can only be done by the consumption of carbon, or in other words, food. Potatoes, linseed-cake, and oleaginous seeds, on account of the starch, sugar, oil, and gum they contain, are well adapted to accomplish this end. If we reflect for one moment on the immense importance of the liver and lungs in the animal economy, is it not strange to see the score of diseased ones which our shambles are constantly exhibiting? showing the great inattention the farmer pays to the comfort and well-being of his cattle. Fat is a reservoir of carbon for the system to draw upon for the purposes of combustion, in the event of the food not containing a sufficient quantity of the proper elements to keep up animal heat. As manure is an important result attending the feeding of animals, it may be well to remark that its quantity depends upon the refuse of food, and the amount of absorption going on in an animal's body, or in other words upon its own destruction, thus returning to inorganic nature, as food for vegetable life, the elements of its own nature. But the quality depends upon the quantity of nutritious food given to the animal. The young, growing animal requiring increase as well as sustenance, consumes all the nitrogen and fatty matter in its food. The milking cow the same. But in the full-grown, feeding animal a large quantity of these ingredients is not consumed: a rich and valuable manure is the result. In choosing animals for feeding purposes, the farmer often exhibits a remarkable knowledge of physiognomy. He likes a kindly-disposed, quiet-looking animal, with symmetry of carcass; one built for strength, broad across the back and loins, and long quarters, where large masses of muscles are placed, a narrow and deep chest, and "a good handler," or where there is a large quantity of fine, soft hair, with plenty of fatty matter underneath to nourish it. Thus furnished, he has only to put into operation the suggestions of science, and the result must necessarily be both profitable and useful. When we see the extensive application of capital, industry, and science to the manufactures of this country, and the comfort and wealth they produce to thousands of our fellow-creatures, also the dominant influence of its interests, threatening the downfall of the British farmer, surely it is time, and our bounden duty, to unite these same principles, that the abundance of the soil may satisfy both landlord and tenant, and be the means, under the blessing of Divine Providence, of producing plenty of cheap food to the many thousands of our wanting fellow-creatures.

The CHAIRMAN proposed the health of Messrs. Smith and Wood.

Mr. SMITH replied, and expressed his gratitude to Mr. Wood for his elaborate exposition of the subject, and still hoped to see science and practice combined much more than he had done.

Mr. WOOD proposed the health of the Chairman, which was received with loud cheers.

The CHAIRMAN rose and expressed his gratitude for the kindly manner in which they had drank his health. He would have gone farther into the subject before them had it not been so ably treated by gentlemen of practical science. It was from practical men they must expect

useful information; and when they had practical men for their leaders, it was their own fault if they did not benefit by them. He bore testimony to some of the principles laid down by the previous speakers, and said he should feel pleasure in presiding at their meetings. Again thanking them for the honor they had done him, he resumed his seat amidst applause.

Mr. BERNAYS again rose, and said—In order to obtain a fair proportion of fat and lean, it is of the utmost importance that you should be acquainted with the composition of food. We should be very much mistaken were we to judge of the value of food by its *bulk*. Green-top turnips, mangel-wurzel, and red beet, contain 89 per cent. of water; Swedes, 85 per cent.; potatoes, 72 per cent.; oats and wheat straw, 18 per cent.; hay, peas, and lentils, 16 per cent.; and beans only 14 per cent. Hence the latter food is infinitely superior, as to its feeding properties, to the former. But we have only spoken of the food in relation to water; it is necessary that we should understand each other when we make use of certain terms. It is but too indefinite if we include fleshening and fattening in the term *fattening*; the term *rearing* would then be more appropriate. But it would be still better if we distinguish between *fleshening*, or the formation of muscle, and *fattening*, or the formation of fat. According to the quantity of non-nitrogenized constituents of food capable of forming fat, in other words, according to the supposed fattening properties of food, they rank thus:—1. Oats, barley meal, and hay; 2. Beans and peas; 3. Lentils; 4. Potatoes; 5. Turnips and red beet. According to their fleshening properties, they stand thus:—1. Lentils; 2. Beans; 3. Peas; 4. Flesh; 5. Barley meal; 6. Oats; 7. Hay; 8. Carrots and potatoes; 9. Red beet; 10. Turnips; 100 lbs. of lentils are supposed to be capable of yielding 33 times as much muscle as 100 lbs. of turnips. Great advantage, therefore, results from the admixture of food. An animal which has been fed chiefly on oil-cake, would, on being turned out, increase in size much more slowly than the animal which has been fed on hay, or on turnips and hay. The oil-cake produces chiefly fat, and little flesh; hence the movement of the animal will consume much of the ready formed fat, or tallow. It is only when the oil-cake is given with fleshening food—such as beans, oats, and hay—that lean is proportionally formed. Warmth, confinement, and fattening food are most favorable for the formation of butter, fat, and tallow. Herbage—which is generally denominated *poor*, but which, in reality, is *rich* in nitrogenized constituents, and which cows have to crop themselves—is favorable to the formation of cheese, but not of butter.

Mr. STOKES—Would you recommend the food to be given in a warm state?

Mr. BERNAYS—Decidedly; a little lower than the temperature of their own bodies.

Mr. STOKES proposed "The health of Mr. Burrows, and the Stewards."

Mr. B. returned thanks, and said he had been much pleased with the discussion that afternoon. He was sorry that more practical men had not risen to take part in it. He had found by experience that cattle kept dry and warm consumed less, and fattened better.

Mr. HENSON rose and asked what mixture of food Mr. Bernays would recommend. He was at a loss to know how to put these different elements together. He hoped to hear at some future discussion how to produce the largest amount of fat, without losing sight of the manure heap. He proposed the health of "Rev. E. Wilson:" who rose and returned thanks, and expressed his gratification with the discussion. He always found instruction at their meetings.

Mr. STOKES suggested that tables of the quantity and quality of food recommended, should be drawn out and some of the members requested to keep an ox or two, and give the result of their experiments for the benefit of others.

Mr. HENSON made another observation or two relative to the quantities of food and the manure heap, and

Mr. BERNAYS rose and said—I can only say, in answer to Mr. Henson, that I shall be happy to answer his questions as to the necessary quantities of food for producing flesh and fat, on some future occasion.

Mr. EATON said they had much science and a little practice. He would propose "The health of Mr. Walker," who would be able to give them a good deal of practical information (cheers).

Mr. WALKER said he had hoped to have taken his own pleasure on that occasion. He was almost afraid to venture an observation where there had been so much science. He felt inclined to walk away and largely benefit. As a practical man, he intended to make use of what part would suit him. The manure heap had been referred to, and he would observe, it was very well to have the whistle if they did not pay too dear for it. He would not recommend giving oil-cake to store cattle. They ought to be exceedingly careful how they gave oil-cake in the straw yard. Vegetables were the proper food for animals. He gave two pounds of oil-cake a day, and hay, to some cattle, and they did not do well; they were feverish; there was no swelling of the muscle, no lifting of the lean meat. He gave them turnips, and there was immediately an improvement.

Mr. SMITH made a few observations on the importance of attention to the temperature of the atmosphere to which cattle were exposed; and,

On motion of Mr. Henson, seconded by Mr. Stokes, it was resolved—"That this meeting entirely agrees with the science of nutrition now propounded, and recommends the practical farmer to test his theory by his experience."

Thanks were voted to the Chairman, and appropriately acknowledged; and the meeting, which occupied upward of four hours, separated.

AIR CHURN.—The Bishop of Derry has invented an atmospheric churn. Instead of the present unscientific mode of making butter by churning, his Lordship accomplishes this measure by the singular manner of forcing a full current of atmospheric air through the cream, by means of an exceedingly well devised forcing-pump. The air passes through a glass tube connected with the air-pump, descending nearly to the bottom of the churn. The churn is of tin, and it fits into another tin cylinder provided with a funnel and stop-cock, so as to heat the cream to the necessary temperature. The pump is worked by means of a winch, which is not so laborious as the usual churn. Independently of the happy application of Science to this important department of domestic economy, in a practical point of view it is extremely valuable. The milk is not moved by a dasher, as in the com-

mon churn; but the oxygen of the atmosphere is brought into close contact with the cream, so as to effect a full combination of the butyraceous part, and to convert it all into butter. On one occasion the churning was carried on for the space of one hour and forty-five minutes, and eleven gallons of cream produced twenty-six pounds of butter. [London Farmers' Mag.

REV. GILBERT WHITE'S NATURAL HISTORY OF SELBORNE.

THE LANGUAGE OF BIRDS.....CHARACTER AND HABITS OF THE WHIP-POOR-WILL.

It would be about as easy to "gild refined gold,' as, with our pen, to add anything to the force of the following essay, recommending every one in the country to habituate himself to noting all facts which may serve to extend the knowledge of *Natural History*. With such a habit, there is scarcely a school-boy who might not impart something new to the book-learned student of Nature. Who is it that cannot trace much of all his knowledge of this sort to his observation of facts while he was even yet in his teens? And, seeing the progress of modern discovery in every walk of Science, who shall set limits to what remains to be developed?

The inexhaustible resources for recreation and amusement which such a habit opens for him who once catches the inspiration, make for him those moments the most delightful, which hang like an incubus on the spirits of the listless, uncultivated drone. Walks and rides, that to the latter prove monotonous and fatiguing, to the former reveal, at every step, food for meditation, and elements of knowledge, elegant or useful. It is impossible for those who will not cultivate a sensibility to the beauties and varieties of Nature, in her humbler walks and works, to know how much there is to challenge their admiration in the most beaten paths of rural life and occupations. If he would be persuaded of this, let him take up, for instance, the "NATURAL HISTORY OF SELBORNE, BY THE LATE REV. GILBERT WHITE."

Selborne is a single parish in the County of HAMPSHIRE, England—affording, as might be supposed, in a scope so limited, but slender contributions to the stock of Natural History; but let him who may so conclude, put this delightful little volume in his overcoat pocket, the first time he has to make a journey by railroad or steamboat, on which he may have either no acquaintance, or may wish to escape from being bored by some male or she metaphysician in religion or politics; and our word for it, that, with such a pocket companion, he will find his journey more than one-half shortened.—To say more of the fruitfulness of the subject, and the expediency of cultivating a fondness for it, as illustrated by these notes of a clergyman and a scholar, in the confines of a single parish, would lead us on to a review of the book, which is not our design—the more especially as we contemplate a better use of it, some day, for the readers of the FARMERS' LIBRARY. The occasion, however, would seem to suggest the expression of regret that the minds of *our clergymen* should so rarely take the turn in which this amiable and engaging English pastor found the means of hallowing, with such agreeable associations, the name of his parish and his own.

To them, and, more especially, those of them who reside in the country, Natural History, in almost all its branches, appears in a peculiar manner to offer attraction and reward. Unfortunately, however, we are too apt to conclude that no ingenuity can impart interest for others to subjects which daily notice may have made familiar to ourselves; while, in truth, the man of simplest tastes, with feelings attuned to Nature, has but to betake himself to the most frequented highway, and thereupon make a *sentimental journey!* We will here, for example, take up on the spot, as it lies within reach, these said simple sketches of the Natural History of a single old English parish, and transfer, haphazard, a single chapter as it may open to us.

Well, it chances to be the one at page 260, on the "LANGUAGE OF BIRDS." Now, reader, mark what he makes even of the familiar subject of *Barn-Door Fowls and their habits!*

From the motion of birds, the transition is natural enough to their notes and language, of which I shall say something. Not that I would pretend to understand their language, like the vizier, who, by the recital of a conversation which passed between two owls, reclaimed a sultan,* before delighting in conquest and devastation; but I would be thought only to name that many of the winged tribes have various

* See Spectator, Vol. vii. No. 512.

sounds and voices adapted to express their various passions, wants, and feelings—such as anger, fear, love, hatred, hunger, and the like. All species are not equally eloquent; some are copious and fluent, as it were, in their utterance, while others are confined to a few important sounds; no bird, like the fish kind, is quite mute, though some are rather silent. The language of birds is very ancient, and, like other ancient modes of speech, very elliptical; little is said, but much is meant and understood.

The notes of the eagle kind are shrill and piercing, and, about the season of nidification, much diversified, as I have been often assured by a curious observer of Nature, who long resided at Gibraltar, where eagles abound. The notes of our hawks much resemble those of the king of birds. Owls have very expressive notes; they hoot in a fine vocal sound, much resembling the *vox humana*, and reducible by a pitch-pipe to a musical key. This note seems to express complacency and rivalry among the males; they use also a quick call and a horrible scream, and can snore and hiss when they mean to menace. Ravens, besides their loud croak, can exert a deep and solemn note that makes the woods to echo; the amorous sound of a crow is strange and ridiculous; rooks, in the breeding season, attempt sometimes, in the gayety of their hearts, to sing, but with no great success; the parrot kind have many modulations of voice, as appears by their aptitude to learn human sounds; doves coo in an amorous and mournful manner, and are emblems of despairing lovers; the woodpecker sets up a sort of loud and hearty laugh; the fern-owl, or goat-sucker, from the dusk till day-break, serenades his mate with the clattering of castanets. All the tuneful *passeres* express their complacency by sweet modulations and a variety of melody. The swallow, as has been observed in a former letter, by a shrill alarm, bespeaks the attention of the other *hirundines*, and bids them be aware that the hawk is at hand. Aquatic and gregarious birds, especially the nocturnal, that shift their quarters in the dark, are very noisy and loquacious—as cranes, wild-geese, wild-ducks, and the like; their perpetual clamor prevents them from dispersing and losing their companions.

In so extensive a subject, sketches and outlines are as much as can be expected; for it would be endless to instance in all the infinite variety of the feathered nation. We shall therefore confine the remainder of this letter to the few domestic fowls of our yards, which are most known, and, therefore, best understood.—And first, the peacock, with his gorgeous train, demands our attention; but, like most of the gaudy birds, his notes are grating and shocking to the ear: the yelling of cats, and the braying of an ass, are not more disgustful. The voice of the goose is trumpet-like and clanking, and once saved the Capitol at Rome, as grave historians assert; the hiss, also, of the gander is formidable and full of menace, and "protective of his young." Among ducks the sexual distinction of voice is remarkable; for, while the quack of the female is loud and sonorous, the voice of the drake is inward, and harsh, and feeble, and scarce discernible. The cock turkey struts and gobbles to his mistress in a most uncouth manner; he hath also a pert and petulant note when he attacks his adversary. When a hen turkey leads forth her young brood, she keeps a watchful eye; and if a bird of prey appear, though ever so high in the air, the careful mother announces the enemy with a little inward moan, and watches him with a steady and attentive look; but, if he approach, her note becomes earnest and alarming, and her outcries are redoubled.

No inhabitants of a yard seem possessed of such a variety of expression, and so copious a language, as common poultry. Take a chicken of four or five days old, and hold it up to a window where there are flies, and it will immediately seize its prey with little twitterings of complacency; but, if you tender it a wasp or a bee, at once its note becomes harsh and expressive of disapprobation and a sense of danger. When a pullet is ready to lay, she intimates the event by a joyous and easy, soft note. Of all the occurrences of their life, that of laying seems to be the most important; for, no sooner has a hen disburdened herself, than she rushes forth with a clamorous kind of joy, which the cock and the rest of his mistresses immediately adopt. The tumult is not confined to the family concerned, but catches from yard to yard, and spreads to every homestead within hearing, till at last the whole village is in an uproar. As soon as a hen becomes a mother, her new relation demands a new language; she then runs clucking and screaming about, and seems agitated as if possessed. The father of the flock has also a considerable vocabulary; if he finds food, he calls a favorite concubine to partake; and, if a bird of prey passes over, with a warning voice he bids his family beware. The gallant chanticleer has at command his amorous phrases and his terms of defiance. But the sound by which he is best known is his crowing; by this he has been distinguished in all ages as the countryman's clock or larum—as the watchman that proclaims the divisions of the night. Thus the poet elegantly styles him

> "The crested cock, whose clarion sounds
> The silent hours."

A neighboring gentleman one summer had lost most of his chickens by a sparrow-hawk, that came gliding down between a faggot pile and the end of his house to the place where the coops stood. The owner, inwardly vexed to see his flock thus diminishing, hung a setting net adroitly between the pile and the house, into which the caitiff dashed and was entangled. Resentment suggested the law of retaliation; he therefore clipped the hawk's wings, cut off his talons, and, fixing a cork on his bill, threw him down among the brood-hens. Imagination cannot paint the scene that ensued; the expressions that fear, rage and revenge inspired were new, or at least such as had been unnoticed before. The exasperated matrons upbraided—they execrated, they insulted, they triumphed. In a word, they never desisted from buffeting their adversary till they had torn him in a hundred pieces.

Thus, instead of a line of introduction merely, as we had intended, to a long but most impressive essay from an English periodical, we have been led on to add chapter upon chapter.

What a beautiful parlor-table book, by-the-bye, might be made *on the Natural History of Long Island!* with colored drawings of specimens and of individuals of all the departments to be found there, where still exists such a wonderful proportion of all the known birds of North America.

We know not how far this may, in fact, have been accomplished, by the powerful aid of Doctor DEKAY, in the Natural History of the State of New-York, prepared by authority; but we could wish that the library of the American naturalist could be enriched by some such scholar, with a separate work on the natural history of a region so remarkable and so rich, in a style that should be in suitable keeping with the progress of all the arts that might contribute to illustrate it.

We should be ashamed to be ignorant of the GREAT WORKS OF AUDUBON; but how far is that beyond the reach of Farmers, who object even to the cost of the FARMERS' LIBRARY, with its two annual volumes of 600 pages each, and all its expensive engravings?

For the sake of placing Audubon's works in every public Library in the country, to be open to the public use, how much more wisely might the general Government spend a small portion of the hundreds of thousands of dollars, which are now expended of the people's money for *military* memoirs, surveys, reconnoissances, books, reports, and schemes for blowing up ships and scattering death and destruction?

Being so far in for it, let us pay to his genius the tribute of a single extract, in point, from that inimitable *American* ornithologist, WILSON, whose delineation of the manners of the different species of birds that fell under his personal notice might be studied as models by every describing naturalist, and read with pleasure by every man of taste. His exquisite touches may well lead one to think that the naturalist, as it has been said of the poet, "*Nascitur non fit.*"

See what he says of one of our early spring visitors, the *Whip-poor-will!*

And here let us ask the gentle and kind-hearted lover of Nature, if he can ever, or would even wish to become insensible to that sort of melancholy yet not unpleasing emotion, excited by the shrill note of this mysterious bird, when his first returning salutation "strikes the key of remembrance and moans on the ear?" Imagine yourself riding slowly homeward through some lonely wood, the trees casting in the bright moon-light their fanciful shadows across your way; the mind falls naturally to musing on the vicissitudes of life, and retrospect lifts once again the curtain that oblivion would hang over the past; the earliest scenes in the play of life are the first to be reacted: school-boy companions, long since departed and almost forgotten, reappear in all the joyous freshness of youth, and as you approach your own dear home, where affection waits your coming with impatience, you almost audibly to yourself repeat from that best of English poems—

"The breezy call of incense-breathing morn,
The swallow twittering from the straw-built shed,
The cock's shrill clarion, or the echoing horn,
No more shall rouse *them* from their lowly bed;
"For *them* no more the blazing hearth shall burn,
Or busy housewife ply her evening care;
No children run to lisp their sire's return,
Or climb his knees the envied kiss to share."

In the midst of such meditations, the ear is suddenly struck by the sharp, clear-toned "*Whip*-poor-*will*," "*Whip*-poor-*will*," as if he *meant* to arrest and quicken your attention to some message of ominous portent. A feeling of deeper sadness, not immingled with curiosity, comes charmingly over you, and you are willing to listen, even though in dread of some painful tidings of domestic calamity, or you fancy this bird of night may be placed near your homestead to telegraph the death of dear and distant relatives. The reader that has never felt, will smile at such vain imaginings; so we give him the fine description of this singular bird, by Wilson, whose prose is conceived in the spirit of poetry—who always dipped his pencil in the colors of truth, and painted Nature to the life:

"On or about the 25th of April, if the season be not uncommonly cold, the Whip-poor-will is heard in Pennsylvania, in the evening, as the dusk of twilight commences, or in the morning as soon as dawn has broke. The notes of this solitary bird, from the ideas which are naturally associated with them, seem like the voice of an old friend, and are listened to by almost all with great interest. At first they issue from some retired part of the woods, the glen, or mountain; in a few evenings, perhaps, we hear them from the adjoining coppice, the garden fence, the road before the door, and even the roof of the dwelling-house, hours after the family have retired to rest. Some of the more ignorant and superstitious consider this near approach as foreboding no good to the family, nothing less than the sickness, misfortune, or death of some of its members. Every morning and evening, his shrill and rapid repetitions are heard from the adjoining woods; and when two or more are calling at the same time, as is often the case in the pairing season, and at no great distance from each other, the noise, mingling with the echoes from the mountains, is really surprising. Strangers, in parts of the country where these birds are numerous, find it almost impossible for some time to sleep; while to those long acquainted with them, the sound often serves as a lullaby to assist their repose. The notes seem pretty plainly to articulate the words which have been generally applied to them, '*Whip-poor-will*,' the first and last syllables being uttered with great emphasis, and the whole in about a second to each repetition: but when two or more males meet, their whip-poor-will altercations become much more rapid and incessant, as if each were straining to overpower or silence the other. When near, you often hear an introductory cluck between the notes. At these times, as well as almost at all others, they fly low—not more than a few feet from the surface, skimming about the house and before the door, alighting on the wood-pile, or settling on the roof. Toward night they generally become silent, unless in clear moonlight, when they are heard with little intermission till morning."

NATURAL SCIENCES.

ON THE IMPORTANCE OF AGRICULTURISTS ACQUIRING A KNOWLEDGE OF THE NATURAL SCIENCES AND A HABIT OF ORIGINAL OBSERVATION.

BY JAMES H. FENNELL, AUTHOR OF A "NATURAL HISTORY OF QUADRUPEDS."

NUMEROUS facts on record unite to convince me that agriculturists would find it very advantageous to habituate themselves to making minute examinations of little objects and incidents in nature which occur at every step, but are too often disregarded. It is desirable that agriculturists should not only read books on Natural History, but that they should closely observe with their own eyes everything in the fields, orchards, and gardens, that they may glean some useful hints from Nature's own volume.

In the cultivation of plants, it has been found best to proceed on such scientific principles as a correct knowledge of their structure and functions will suggest. The system of assolements, or the rotation of crops, by which the produce of our land has been quadrupled, and the acclimation of plants by hybridization or engrafting, by which means the fruits and flowers of more southern regions are reconciled to our climate, are only two out of many examples which might be adduced of the benefits conferred by Botany upon Agriculture.

While Science dictates such valuable improvements as these, the mere observation of trifling facts often suggests useful ideas. It is said that the occasional natural union of the boughs of distinct trees demonstrated the practicability of grafting, and that the observation of the circumstance of a vine shooting more vigorously after a goat had browsed on it, suggested the valuable art of pruning fruit-trees. In the sixty-third volume of the *Philosophical Transactions*, we find it related that M. Mustel, having observed that some of the flower-buds of an apple-tree had been gnawed off by a snail, in such a manner that all the petals and stamens had disappeared, being eaten up close to the calyx, which, together with the basis of the pistillum and the embryo were left uninjured, concluded that those imperfect flower-buds would bear nothing, but was soon convinced of his mistake. Nearly all of them bore fruit; the apples were perfectly formed, and six or seven pretty large ones were seen upon each bunch. On the other hand, the snail had spared some other bunches which it could not so easily get at; but, out of ten or twelve flowers in each of these bunches, not above one or two exhibited any signs of fruit. This suggested to M. Mustel the idea that, when the flowers of trees are full blown, the prevention of the natural fall of the petals and stamens gives a greater assurance of the fructification—a fact which he several times proved; for, having cut off with the scissors the petals of apple, pear, plum, and cherry blossoms, close to the calyx, he found that almost every one of them bore fruit, whilst several of the uncut flowers bore none. Thus did a snail teach him how to render a tree more fruitful.—One of the Emperors of China, having noticed that a particular stalk in his garden produced better rice than the rest, cultivated it for several years: and then, having fully satisfied himself and his subjects of its superiority, he distributed its grains among them for their general benefit. A Sussex farmer, having remarked that some gooseberry bushes, growing under an elder tree, were exempt from the attacks of caterpillars, was induced to try the efficacy of a decoction of elder leaves in destroying the grubs that infested his turnip crops; and he, and other farmers who repeated the experiment, found it successful.

Here I may observe that it is not only necessary that the agriculturist should be well acquainted with the nature of the different vegetables which he cultivates for economic purposes, but that he should rightly understand the causes of the several ravages and diseases to which they are subject, so that he may be able to devise proper remedies and preventions. In this wide field for observation and practice, Natural History will be found a useful guide. In nine cases out of ten, the failure of crops, and the pecuniary loss experienced thereby, arises from the attacks of some particular species of destructive insect, which, from unknown causes, has appeared in unusually great numbers. Before any effectual steps can be taken against it, it is absolutely necessary to ascertain correctly what species of insect is causing the mischief, and to study the creature's habits in all its transformations; for what will prove more or less effectual in one stage of its existence, will be totally useless, or, perhaps, increase the evil in another.—Notwithstanding the immense annual losses which must be caused by the millions of destructive insects that infest all kinds of crops, the science of Entomology is comparatively neglected by agriculturists, who are, therefore, frequently unable to give a definite description of any noxious insect to a naturalist when they require his opinion and advice.

Those husbandmen who have possessed some knowledge of Natural History have not merely been better able to cultivate their plants and protect them from the attacks of hurtful creatures, but they have ascertained thereby what creatures are harmless and useful, and therefore to be spared and encouraged. Without this power of discrimination they may be unwittingly led into the error of destroying creatures which were absolutely beneficial to them. Lady-birds, which are now well known to be most useful little creatures, feeding only upon the hurtful plant-lice, were at one time as mercilessly destroyed as the plant-lice themselves.—We are told by Mr. J. D. Salmon that, in the neighborhood of Scoulton, in Norfolk, there is a very extensive colony of black-headed gulls, *(larus ridibundus,)* which are carefully protected and encouraged by the farmers, who have noticed that they render most useful service by following the plow to feast on the cockchaffer grubs and other insects that it turns up to the surface. So greatly do the farmers value the

assistance of these birds, that they have implored the proprietor of the mere at Stanford Warren to discontinue gathering their eggs. In the first season after their eggs were spared, it was calculated that not less than 15,000 young birds were hatched: and the immense supply of food which this numerous progeny required, greatly increased the exertions of the old birds in obtaining for them many thousands of worms and insects.

Those farmers who, from ignorance, permit poisonous wild plants to spread unchecked, frequently sustain serious losses among their cattle: for though these animals refuse such plants when grown to maturity, yet in the early spring, when there is a deficiency of herbage, and the noxious sorts betray no sensible odor, they will eat, in their extreme eagerness for green food, almost anything that presents itself. Linnæus mentions the death of many cattle from feeding, in early spring, upon the water-hemlock, *(cicuta virosa:)** and, more recently, Mr. Edwin Lees has recorded the death of several fine cows from eating the roots of a poisonous umbelliferous plant which had been carelessly suffered to grow about the sides of a ditch.

Natural History, in its most extensive sense, being inseparably connected with all the arts of life, ought to form a part of the education of those who wish to promote them and to benefit by them. In every school in the kingdom, whether intended for males or females, for the rich or for the poor, Natural History should find a foremost place as an elegant and useful accomplishment. There is hardly a common animal or plant concerning which some egregious error may not be detected in the minds of the generality of what are termed well-educated people, who pride themselves on possessing a *finished* education—finished, indeed, before it had fairly commenced; for they who have learnt anything know that neither man's nor woman's education can ever be complete, as every day of our lives may be made to yield an improvement upon the lessons of our youth. No one will rest content with what he knows to-day, unless he wishes to be a dunce to-morrow. The wisest men love to call themselves students and laborers in the mines of Knowledge, seeking for new facts and even for new sciences that are yet in concealment, and which are destined to improve the earthly condition of man, and to impress him still more strongly with an incessant conviction of the care which God has taken to provide innumerable blessings for His industrious and grateful people—blessings which He has but temporarily hidden from us, so that we have the advantages of labor, health, and hope, in seeking for them. All the world was simply Nature when God completed it; and Natural History, in its widest meaning, is the history of that world of Nature; and, therefore, ignorance of Natural History is ignorance of God's world, which presents the most sublime and useful study man can pursue.

How general the existence of ignorance is on the subject of Natural History may be easily conceived from the absurdities relative thereto which may be found in the writings of even the most popular essayists, novelists, critics, and others who are more literary than scientific.—Latin, Greek, and Heathen mythology have been too frequently learned, to the entire exclusion of any knowledge of those divine works by which we are surrounded, and whereby we may practically benefit ourselves and fellow-creatures. In Sweden, Natural History is the study of the schools by which men rise to preferment: and we are assured by the celebrated botanist, Sir J. E. Smith, that there are no men with more acute or better regulated minds than the Swedes. In the forests of Germany, especially in the small States of the interior—the Hartz, Thuringia, &c.—there are schools in which are taught Surveying and Planting, together with the Zoology, Botany, and Mineralogy of the forest. At one of the most celebrated schools in the world—namely, that of M. De Fellenberg, at Hofwyl, in Switzerland—it is the chief aim of the instructor to inculcate in his numerous pupils the importance of closely examining such surrounding objects of Nature as will most concern them when pursuing the particular professions and trades for which they are intended. The school contains about 450 scholars, among whom are many peasant boys; and no opportunity is lost of directing the attention of all, but especially of the latter, to Nature's works; which are eagerly sought after, attentively studied, and most carefully perused for future reference and instruction. The collecting of these objects affords an employment which is not only amusing and useful, but healthy. The museum thus formed is constantly increasing, both in variety and utility. The plants it contains are not classified scientifically, but according to their properties, uses, and localities.—Seeds and specimens of useful sorts of wood enrich this botanical collection. Quadrupeds, birds, reptiles, and insects are also studied and preserved by the pupils. The winter evenings are instructively spent in this room by the poor children with their master: and on Sundays, after church, they go forth to the hills and woods, seeking fresh treasures for their museum. At Carra, in the neighborhood of Geneva, there is also an agricultural school, where the children are taught the economic Botany of their native country, besides a variety of other useful subjects. They amuse themselves with botanical excursions, and the little students carefully bring home and preserve all the plants which they collect.

Hogg, the Ettrick shepherd, declares that those writers speak falsely who assert that our laborers, herdsmen, and peasants in general, have little or no feeling of the beauty of Nature; and he might have added that they are frequently close observers of her works. This fact induces me to believe that much benefit would arise by giving a more scientific aim to their habit of observation. How readily the shepherd notices slight external differences, even in objects of the same species, is exhibited in his ready discrimination of any one sheep in a flock consisting of even many hundreds, though to the casual observer all the sheep seem exactly alike. Without some nice study of Nature's minute distinctions, the shepherd could not so easily detect any sheep in a large flock.

The aptitude of peasants to receive scientific truths, when their curiosity is properly awakened, might be illustrated by mentioning a glorious list of eminent philosophers who have arisen from the ranks of shepherds, plowmen, &c.—We shall, however, mention but two examples. At Bagis-Beost, near the hot springs of the Pyr-

* A similar plant, *œnanthe crocata*, has lately been discovered by Prof. Christison to be innocuous to man and animals in Scotland, though in the south of England, and also in France and Spain, it has proved itself an active poison. [*Editor.*

enees, lives Gaston Sacaze, whose name has been well known for the last twelve years to philosophical travelers in those parts. Without even quitting his native mountain, or neglecting the care of his flock and the cultivation of his fields, he has found sufficient time to acquire a good systematic knowledge of the Mineralogy, Botany, and Entomology of his native district, entirely unassisted by any teacher except his own eyes and a few books. That he might read the works of Linnæus, he has taught himself Latin. Besides systematically classifying all the mountain plants, he has drawn and colored them, so as to form a rich herbal. At his humble home he has also formed a collection of minerals, stones, insects, &c.; and, when tending his flock, he amuses himself with a violin of his own constructing, and songs of his own composing. So much notice have his talents attracted, that his portrait has lately been taken by the celebrated painter, Devéria. This peasant naturalist calls to mind the instance of John Bertram, the famous Pennsylvanian botanist, who was originally an agricultural laborer, but having his intellectual curiosity excited by an attentive contemplation of a violet, and then dreaming about its beauty and structure, immediately set about learning all the Latin that was requisite to read botanical works.

Great Britain abounds in grammar schools for the poor, but where can it show anything like the forest schools of Switzerland, Sweden, and Germany? Where are the instructors to teach our peasantry those sciences which they would be practically benefited by understanding?—We want to see a full consummation of the benevolent wish of Dr. Drummond, that a lecture-room, a museum, and a useful library should be attached to every village, as regularly as its church or chapel; and that a portion of time should be appropriated to teaching Natural History, and even Natural Theology, to the peasantry. Geology and Agricultural Chemistry should also be made to throw their light upon the laborer's mind, and his children should be taught something about these subjects, as well as grammar and ciphering. Agriculture would more rapidly attain to perfection, if all, without exception, who are concerned in it, were made clearly to understand the processes on which its fullest success depends. The laborer could not fail to become more skillful and more interested in his employment, if he were taught to practice it as a science, and not merely as a toil.

The culture of plants will become a comparatively easy process when we are better acquainted with their peculiar functions, and with the chemical elements which they require for their growth and maturation. We must not be content with knowing what are their respective natural localities, climates, and seasons, but must learn what chemical gases each species imbibes from the atmosphere, through its leaves, and what substances from the soil, through its roots. "If a plant be distinguished by its containing a notable proportion of soda, silica, &c. the soil in which it is to be grown must," as a writer in the *Edinburgh Journal* justly observes, "contain these elements, otherwise the attempt will be abortive;" for a plant can no more create soda or silica within itself than it can form water for its support, independent of the soil or atmosphere. From a knowledge of the principles, therefore, a rational theory of Agriculture may be formed; and what has hitherto been little better than an expensive and often distressing system of trial and error, becomes a science guided by fixed laws. Agriculture will always have to contend with the fluctuations of season and climate: but it is for human ingenuity to modify their influence, and this can only be effected by rational and scientific procedure. As yet, the science of Agriculture is only in its infancy; but the time is not far distant when it will rank with other maturer branches of knowledge—when every soil will be systematically treated for the species of crop to be raised upon it—when manures will be manufactured as we now manufacture soda and sulphuric acid—when plants will be fed and stimulated as we now treat animals—in short, when the farmer will sow and reap with as much security as the distiller produces his spirit. The value of the science of Chemistry to the agriculturist may be judged from the fact that, when the great French chemist, Lavoisier, took a quantity of land into his own cultivation, he very soon succeeded in doubling its produce.

If the proprietor of land would explore its mineral productions with a view to speculation in them, he ought previously to obtain some knowledge of Geology. To an ignorance of this subject may be traced the lavish expenditure of money in many futile attempts to find coal in situations where the slightest regard to the principles that have been established, and the rules that have been discovered, relative to the association of coal with certain stratified rocks, would have saved those individuals from ruin and misery. As a striking example of the serious consequences that have ensued from seeking coal without acting under the guidance of geological principles, Sir John Herschel relates that an attempt was made, not many years since, to establish a colliery at Bexhill, in Sussex—the appearance of thin seams and sheets of fossil wood and wood coal, with some other indications similar to what occur in the neighborhood of the great coal beds in the north of England, having led to the sinking of a shaft, and the erection of machinery on a scale of vast expense. Not less than £300,000 are said to have been expended in this project, which, it is almost needless to add, proved completely abortive, as every geologist would at once have declared it must—the whole assemblage of geological facts being adverse to the existence of a regular coal bed in the Hastings strata; while this, on which Bexhill is situated, is separated from the coal measures by a series of interposed beds, of such enormous thickness as to render all idea of penetrating through them absurd.—The history of mining operations is full of similar cases, where a very moderate acquaintance with the usual order of Nature, to say nothing of theoretical views, would have saved many a sanguine adventurer from utter ruin.

In learning the nature of the underlying soils, and the character of the surface soil, which in many instances depends upon the decomposition of the subterraneous strata, Geology affords most valuable assistance. From the mere description of the character of any line of country, the geological agriculturist might form a tolerably accurate notion as to what must be the productions, pursuits, wants, and even the general constitutions of the inhabitants; and, if he possessed a knowledge of Geological Botany and Geological Entomology, he would also be able to predict what genera of plants and insects were there most plentiful. Geology could point out to him stores of lime and mineral manure in

places where they were not generally known to exist. Without an ample supply of water, no farming can be prosperously conducted; and here again Geology comes to our aid, and suggests the formation of those Artesian wells which have given the precious blessing of water to many previously dry districts, as in France and various parts of England. Observation on the surface of the earth detects the deep reservoirs below. "Search and ye shall find;" for wherever deposits of a light and porous nature occur in hollows and depressions of firmer and older rocks, water will penetrate until it has accumulated into immense subterranean pools—the pressure of the superior strata preventing the fluid from exhibiting itself to the eye, except in slight oozings at the indented parts of the surface. When proper borings are made through the strata, the water is released from its confinement, and rushes up copiously from the valley or hollow. Beneath those spots of ground over which swarms of gnats are continually seen dancing in the air, the existence of wells may be suspected; for these insects disport themselves always where there is the greatest evaporation. It was by a secret knowledge of this fact that the professors of the divining rod detected hidden wells. Slight superficial observation may also detect concealed mineral springs, which may add to the value of an estate. Thus the discovery of the chalybeate spa at Dorton, in Buckinghamshire, originated from some villager's attention being attracted to the circumstance that a little stream, which issued from a small orifice, destroyed the plants that came within its course; the few blades of grass that were spared bore a thick incrustation of oxide of iron; and the surface of the ground, which, for a few yards on either side of its channel, assumed a yellow and scorched appearance, was covered with a similar metallic deposit. The peasants called it the *Alum* Well—the taste of that substance being most apparent to them. It was also observed here, as at the Bath waters, that diseased cattle voluntarily and repeatedly repaired to the little stream, and rapidly recovered from their maladies. It was noticed that it afforded great relief to horses suffering from that very obstinate and almost incurable disorder, the mange. Owing to the powerful chalybeate qualities of this water, the manure of the cattle that drink of it will burn to a cinder, and is collected for fuel, in the same way that the Peruvian miners and mountaineers make bright and clear fires of the dung of the llamas and alpaccas.

These several facts will, I trust, suffice to show to every reader the policy of the agriculturist greatly enlarging his present sphere of knowledge, and the frequent advantages that would result from his practicing a habit of original observation, with a view of deriving important suggestions from apparently trifling facts.

[Jour. of High. and Agri. Soc. of Scotland.

"LIME ENRICHETH THE FATHER BUT IMPOVERISHETH THE SON."

As "all is not gold that glitters," so all popular mottoes are not the very essence of wise experience. Some have their origin in ignorance, and gain currency for want of examination. With the majority of mankind, it is much more agreeable to take things for granted, than to go through the trouble of investigation. This lazy disposition, inherent in our nature, to take things for granted, gave rise to the story or the fact, of the French philosophers, who, on being asked by Doctor Franklin *how* it was that a pot full of water would not overflow if a two foot rock-fish should be put into it, straightway put on their considering caps, and set about gravely to account for it, without ever asking whether the *fact was really so!*

On this vulgar compound of ignorance and credulity, many an empiric and charlatan has traded and passed himself off, within our observation, for a *wise man*, whose only virtue was that which has been called a rascally one—denominated *prudence*. They have had the prudence to keep their mouths shut, aware of the common saying that a "still tongue shows a wise head!" while in many cases it is the fruit more of cunning, than of wisdom.

The motto at the head of these remarks, is not only fallacious but mischievous; and knowing how apt the best of us are to be misled by sententious and oracular expressions of this sort, especially where they address themselves to our avarice or indolence, the obligation is the greater to denounce and expose it.

Far from dissuading young farmers from the use of lime, under the specious theory that *every thing that stimulates, must be followed by exhaustion*, there is no service that we could render to Agriculture, of which we should be prouder, than if we could devise some means, whereby every young farmer in Maryland and Virginia, and all the old States, could procure *an adequate supply of lime*, to put from 50 to 100 bushels on every acre of his worn-out land. In truth, we regard this as the *great desideratum* of a large portion of the States above named. The real question is, not whether the use of lime be judicious and advisable, but *how is the poor farmer to get it*, and at how high a price will he be justified in going before he should decline the use of it?

Instead of fearing that he may enrich himself and impoverish his son by ulterior exhaustion of his land, if there be any one commodity for which Prudence herself would hold him justified

in *going in debt,* that *commodity is lime!* and if prudent and judicious young farmers could command the capital to buy it, even borrowed capital. the increased product of the land would redeem the debt with more certainty than most mercantile adventures can do. for which it is so easy in towns to raise the means; and the whole aspect of the country would be changed and improved.

Let any one who wants to see the effect of capital so applied, and especially as far as *lime* may be involved in the inquiry, look at the farm of F. P. Blair, Esq. near Washington. Reference to all such cases, we are aware, is apt to be met by the ready suggestion, that "with plenty of money, every one can improve and fertilize and give a new aspect to poor land;" but this is not true, for many a man, though not meaning to be improvident, squanders his means and wastes his exertions in unskillful appliances of both; but even if it were true, what better service to the landed interest, ay, and to the country, can any man of means render, than to show how capital may be made to yield adequate return, when applied with judgment to *the most important and useful of all human pursuits?* Such men become eminent benefactors of the commonwealth, by demonstrating under the very eye of city capitalists, that their sons would do wisely to betake themselves to farming, instead of being all huddled together in cities, as if it were the *country* that is infected with plague, pestilence and famine!

Returning to *lime*, which, with ashes, we understand to be the basis of regeneration, effected in the estate to which we have already referred, we may add that we understood Hon. Willoughby Newton of Westmoreland, Virginia, some days since to say, that he had made on an estate on the Potomac, this year, *eight per cent* on all the capital embarked, as well in the cost of the farm, as on all the property employed and all the expenses incurred in the cultivation, and his chief reliance is on *lime.* The staid and judicious farmer of Montgomery county—exemplary in all things. with a few exceptions (such as not *taking the* Farmers' Library) don't stop to inquire whether lime "enricheth the father but impoverisheth the son." All he asks is, (and that after ample experience and close calculation,) "*by what means, and how much can I get.*" To get money to buy lime, they will sell almost any thing but wife and children and a favorite dog; for they know that if they can get enough of it, instead of impoverishing the son, they can "set him up" in their own life time.

Referring once more to the motto that "*Lime* enricheth the Father. but impoverisheth the Son," the true explanation is so well given in the following which we find in the North British Review, that we give it in lieu of, and as better said, than any thing we could offer:

"The addition of lime to the land has, in nearly all well cultivated countries, extensively prevailed at every period of authentic history. In Europe, its use has been universal, and every where the same observation has been commonly made, and has become a proverb in almost every language. "Lime," the proverb says, "enricheth the father, but impoverisheth the son." Laid on in repeated doses, and for a length of time, the luxuriant crops it raises at first gradually fall off, till at length, even with the stimulus, as it is called, of larger doses, the land refuses to be excited. A like result has been observed of late years from the application of gypsum, of nitrate of soda, of common salt, or of saltpetre. Their good effects were apparent for a certain number of years, but they gradually ceased to act, and the land was afterwards believed to be even weaker and less productive than before. How are these results to be explained? Can this apparent exhaustion be prevented? Can it easily be remedied? Is it a necessary consequence of the use of lime, and of the other substances we have mentioned? Is the manure or the farmer to blame for the result? The plant carries away from the soil say 10 substances. The soil is deficient in one of these, and the plant cannot grow. That one is lime or soda. You add it to the land, and your crops spring up luxuriantly. Rejoiced at this result, you add more lime, and your crops still grow well—for it requires the addition of 300 or 400 bushels to an imperial acre to add one per cent. of lime to a soil which is 12 inches in depth. But after many crops the lime at length ceases to benefit the land, the crops are even smaller than they were before lime was first added, and the farmer is at a dead stand. Now what has he been doing all this time? He has been adding one thing only in his lime—he has been carrying off 10 in his crops. Is it any wonder, then, that after a lapse of years, the land should become poor in one or more of the other nine? The iron-smelter throws into his furnace his ore and his coal, but he gets no metal until he puts in lime also. He adds a dose of lime, and he draws off a running of metal. He adds more lime, and he procures perhaps more iron. But he very soon finds that lime does no farther good; he has melted out all the iron; he has exhausted his furnace; the stimulus of lime has no effect. He must add ore and coal again, and again he will obtain his periodical flows of metal. So it is with the soil. The farmer who hopes by the continual addition of one thing, to make his land produce continual good crops, hopes and acts against reason. It is his fault that the land has become exhausted, and the cure is in his own hands. Lime, therefore, does not necessarily "impoverish the son." But any treatment will ultimately make the land poorer which does not return to the soil all the things which the crops have carried off, and at least in equal proportion."

Remarkable and Important Discovery. An Italian chemist has discovered a liquid preparation which will stop the worst hemorrhage, even that from cutting an artery. It is applicable to many other purposes; and if half that is said of it be true, it must prove of great value.

CAPITAL NEEDED FOR AGRICULTURAL IMPROVEMENT;

HOW IS IT TO BE PROCURED?—FARMERS EXHORTED TO UNDERSTAND AND DEFEND THEIR RIGHTS AGAINST THE ENCROACHMENTS OF PRIVILEGED CLASSES.

Among the variety of Banks with titles intended to delude ignorant and credulous, and sometimes corrupt representatives of the farming interest, such as *Farmers'* and Merchants', and Commercial and *Farmers'* and *Farmers'* and *Planters'* Banks, all of which have quickly glided into the hands of speculators on the labors of the farmer; would it not be well to have a Bank that *should pay bills drawn on it expressly for lime and plaster and clover seed, and the necessary implements and buildings?* How much the wealth of some States would be enhanced if some such arrangement for the accommodation of industrious men could be made, and could it not as well as the thousand associations which are formed for the promotion of industry and the security of property, in *all the towns?* In the cities, men of every trade and pursuit as instinctively associate and club together their means and their wits, for the common safety and benefit of *their respective classes*, as you will see a gang of wild hogs, at the sight of the sportsman's dog, run together in the form of a wedge, with the old boar making the point of it, to resist every attack.

In towns, every separate business is formed into, and its interests looked after, by a distinct organization. Hence there are banking and other companies and incorporations of mercers, grocers, merchant-tailors, iron-mongers, dyers, brewers, leather-sellers, bakers, tallow-chandlers, curriers, masons, coopers, blacksmiths, plasterers, stationers, upholsterers, musicians, basket-makers, glaziers, apothecaries, shipwrights, spectacle-makers, clock-makers, comb-makers, soap-boilers, cartmen, porters, watermen, and the Lord knows how many more. By means of such associations, all necessary information is readily procured. The peculiar statistics of each trade, its grievances, its wants, its rights, are all ascertained and understood, and the means of defence and aggrandizement defined and provided for. At the first snuff of "oppression in the tainted breeze," sagacious lobby-members are despatched to attend the Legislature, (composed *nominally* of the representatives of the farming interest,) with the needful to pay their expenses, both direct and *incidental!* It is thus that agriculturists, who constitute the bone and sinew of the land, scattered without concert, credulous and inert, ever have been, and ever will be, preyed upon by trading politicians ever watching the popular tide, to know what side they shall take—

> "So some rats, of amphibious nature,
> Are either for the land or water."

Thus has the farmer's substance always been devoured by idle, unproductive classes of men, whose personal aggrandizement and sinister acquisition of power and privileges, are usually secured at a proportionate sacrifice of the general welfare.

How else but by indolence and credulity on one side, and the incessant encroachments of particular and banded classes, with all their affiliated influences, could it have happened in this isolated republican country, that the landed interest pays *so many millions* for the education and support of favored, unproductive, though honorable and high-minded men,

> "Whose trenchant blades, Toledo trusty,
> For want of fighting have grown rusty,
> And ate into themselves for lack
> Of somebody to hew and hack"—

classes that want nothing but the *name*, to constitute a *nobility*, for in practice it is well known that warrants and life commissions have been often demanded and granted on the ground of *hereditary* claims.

But hoping nothing from Government, not even the release of the sum entrusted to it by a generous foreigner, Smithson, for the diffusion of useful *civil* science, we again invoke the generous feelings and ingenuity of our readers, to devise and suggest some means for affording capital to be *directly employed in the improvement of the worn-out lands of the old States*, in cases where security can be offered, that it will be so employed skillfully and *bona fide* by land-holders, so many of whom want nothing but a helping hand in the beginning, to do all and more than skill and industry can effect with equal certainty in any other pursuit. But no system of short credits will answer in his case, as in that of the merchant or trader. The ship may make her voyage and return with her cargo, the proceeds be realized and the notes taken up, another cargo shipped and return cargo sold, before the farmer begins to realize the benefit of his plaster or his lime. But give him time, and that benefit is more

sure to come, the profit more certain to be realized, than the profit of the merchant. The farmer reaps a double profit in fact—first in the improvement of the land, which enhances the security for the debt, and in a certain increase of the crop, each more than the interest on the debt. But how is *he* to get the means? Let him but change his occupation—let him fly from the *land*; let him abandon the *country*, and form fellowship with any of the various crafts in town, and the same industry and integrity will ensure him credit and capital—nay, as if to assist in, and give activity to, the system which is desolating the country for the aggrandizement of the cities, the legislation of the Government is to be framed as if expressly intended for that end. Thus, the "*warehousing system*" is devised, that he who has no capital, even to pay duties, if he has the credit which industry and good character, and letters based upon them, will command for him in Europe; the Government is to build him a warehouse in which he may store his goods until he can put them up at auction, and sell them to pay the duties. In this way is the power of Government so wielded by the so-called *representatives of the landed* interest as to help along every other class but that on which all others live, as birds live on the grains of the field and the fruits of the orchard. We complain not of this giving a wing to honest industry to make it useful and productive to the State; on the contrary, it is all right; but why make fish of one and flesh of another? Can no plan, no association be devised, to give equal assistance to farmers whose care and skill and industry and economy, would offer a sufficient guaranty for the specific appropriation of the amount to the improvement of his estate? In New-York, the land-holder can raise any reasonable amount on "*bond and mortgage*," and these bonds and mortgages, owing to the ampleness of the security, and the facility with which the money may be at any time realized, pass currently from one capitalist to another, and become favorite objects of investment. While the interest is punctually paid, the principal is rarely called for; in the mean time the estate is improving, and every year making for the holder of the bond and mortgage "assurance doubly sure." In Maryland, and we believe in Virginia, the land-holder, however industrious and exemplary, enjoys no such facility, but is doomed to drudge on through a long life-time, effecting results that, if he could get the means which may be commanded by a *manufacturer or a merchant*, having not so much solid security to offer and no better character than he, would enable him in five or six years to double the value of his estate; for after all, there is no business that will better, and at the same time so *surely* reward capital and industry, as Agriculture will when the labor and capital employed in it *are applied with judgment and economy*.

For ourselves, we confess with shame to no such knowledge of money matters as will enable us to sketch a system to meet the case we have presented. In such matters our evil genius, or misfortune, or fault, has ever been to get clear of that sort of "dust" quite as fast as we could get it. With us, money has ever been truly the representative of labor, but then scarcely can we touch it before it "maketh itself wings and flieth away," so quickly, indeed, that it seems not to go into the chrysalis state, but is as it were *born with wings*. Nevertheless, we will offer, on our own hook, a volume of the FARMERS' LIBRARY, in extra binding, to any one who will supply for its pages an essay, and frame of a bill, for the action of the Maryland and Virginia Legislatures, the object and frame of which shall be, to offer such inducements as will secure to *the land-holder* facilities equal to those enjoyed by other classes, for borrowing capital on the pledge of landed property. The credit must be long, in proportion to the time it requires to realize the benefits; and no system can be effectual which does not make the restoration of the capital easy and certain to the lender or his order: nor will the *great public object*, that of *improving the country*, be accomplished unless the strict application of the fund to that object be in some way secured.

In the mean time we so far venture to intermeddle in *agricultural* politics, as to recommend every land-holder in the United States to bethink himself whether he ought not to demand of the Government, which is his creature, framed for his benefit, and for the support of which he is taxed—whether, we repeat, he ought not to demand of the Government, that for every round dollar expended for the diffusion of *military* knowledge and the support of military establishments, an equal amount, at least, shall be expended for the diffusion of *agricultural knowledge*. On this subject we shall enlarge and insist by every form of argument and illustration, as long as these three fingers can wield a pen. The reader will believe that when we dwell on the want of means to give activity to landed capital and plead for more profitable results to rural industry, it is in no spirit of avaricious hankering after wealth—inordinate wealth, for wealth's sake. No! with all ideas and plans for bettering the condition of the agricultural interest we contemplate only the same fair return for diligence and ingenuity in the use of the plow, that attends them in other pursuits—as far, at least, as depends on any action of government. What we eagerly seek, and almost hope to see, is, that Farmers shall become more enlightened—more apprehensive of

their rights, to the end that in the exercise of the powers of Government, the preference which is due *shall be paid to their concerns.* We wish not, by rendering them discontented to incite them to abandon, but rather to make them love the country, by showing them how fields that are exhausted and would be abandoned in despair and disgust, might be made to yield comfort and honor if not riches to their owner. Having in a just appreciation of their rights and a sense of self-respect, done all that prudence and honor, skill and industry, can accomplish, let them learn to be content with their lot, nor pine at the prosperity of the rich and the great; for neither riches nor greatness can confer happiness. *That* must be found in *virtue.*

"'T is virtue reigning in the generous heart
Alone can true, substantial bliss impart;
'T is this, strong-beaming, though our noon be past,
Bids life's short day be splendid to the last;
Charms pain and sickness in the saint and sage,
And melts to joy the hour of freezing age.
In want, content unenvied wealth bestows;
In sickness patience, and in pomp repose;
All wonders rise at her invoking breath—
A life of rapture from the womb of death."

HONOR TO MERIT.—TRIBUTE TO THE LATE EARL SPENCER.

If any English or French Admiral or General, renowned for success in the trade of war—no matter how unhallowed and diabolical the cause of it—had recently died, it would have been announced in flaming capitals in every paper in the United States; such is the barbarous propensity of mankind to be overpowered by and do abject homage to *military* achievement. Let a civil man of the amplest means, and the noblest inclinations to use them for the benefit of his species—for the increase of bread and the diffusion of knowledge among mankind—die in the midst of his usefulness, and, for all the world cares, he may die; and Editors, knowing for what appetites they cater, will leave him to be forgotten, while all around is teeming with the benefits of his munificence and the fruits of his good example.

For ourselves, we take a mournful pleasure, *Englishman though he was!* in putting on our record the following obituary tribute to Earl Spencer, by the Royal Agricultural Society, on the 5th of November last:

On the motion of Mr. Pusey, M. P. seconded by Mr. Shelley, the following resolutions were carried unanimously, namely:

"That this Council, deeply sensible of the great loss sustained by the Royal Agricultural Society of England, in the lamented death of John Charles Earl Spencer, feels it to be a duty to record its deep sense of his unvarying perseverance in promoting the establishment and advancement of the Sreiety; its sincere estimation of his humility, combined with manliness—of his uniform candor and urbanity; and its cordial sympathy with his family on the visitation with which it has pleased Almighty God to afflict them.

"As a proof of our gratitude and respect toward our late colleague, we elect Frederick Earl Spencer to fill the vacancy in the number of the Trustees of the Royal Agricultural Society of England, caused by the event which we all so deeply deplore."

Mr. John Grey, of Dilston, Northumberland, was then duly elected a General Member of the Council, in the place of Earl Spencer, transferred to the list of Trustees.

THE ROOM OF THE HOUSEHOLD.

BY ELIZA COOK.

There 's a room I love dearly—the sanctum of bliss,
That contains all the comforts I least like to miss;
Where, like ants in a hillock, we run in and out,
Where sticks grace the corner, and hats lie about;
Where no idlers dare come to annoy or amuse
With their "morning-call" budget of scandalous news:
'T is the room of the household—the sacredly free—
'T is the room of the household that 's dearest to me.

The romp may be fearlessly carried on there,
No "bijouterie" rubbish solicits our ear;
All things are as meet for the hand as the eye,
And patchwork and scribbling unheeded may lie;
Black Tom may be perched on the sofa or chairs,
He may stretch his sharp talons and scatter his hairs;
Wet boots may "come in," and the ink-drop may fall,
For the room of the household is "liberty hall."

There is something unpleasant in company-days,
When saloons are dressed out for Terpsichore's maze;
When the graceful mazourka and Weippert-led band
Leave the plain country-dance people all at a stand.
There 's more mirth in the jig and the amateur's strum,
When the parchment-spread battledore serves as a drum.
When Apollo and Momus together unite;
Till the household-room rings with laughing delight.

Other rooms may be thickly and gorgeously stored
With your Titians, Murillos, Salvator, and Claude;
But the Moreland and Wilkie that hang on the wall
Of the family parlor out-value them all.
The gay ottomans, claiming such special regard,
Are exceedingly fine, but exceedingly hard;
They may serve for state purpose, but go, if you please,
To the household-room cushions for comfort and ease.

THE USE OF SALT TO MAN AND ANIMALS.

COMMON salt, or muriate of soda, is the salt which has been longest known. Its effects upon man and animals are striking and important. In moderate quantities it seems to be a natural stimulant to the digestive organs, and is supposed to furnish the necessary supply of soda to preserve the bile in an alkaline and anti-septic condition. The estimation in which salt was held amongst eastern nations is very remarkable, and may be traced to the highest antiquity. There appears, however, to be one portion of the globe in which salt is despised by many of the people. "It much surprised me," says a traveler, "to see some of the South American aborigines eat their provisions without salt, though they have it in great abundance. If you offer them any food that has the least grain of salt in it, they spit it out with great disgust." There are many countries in which salt has never yet been found, and where, owing to the little commercial intercourse, the inhabitants can only occasionally indulge themselves with it as a luxury. In the interior of Africa this is particularly the case. "It would appear strange to an European," Mungo Park observes, "to see a child suck a piece of salt as if it were sugar. This, however, I have frequently seen, although the poorer class of inhabitants are so very rarely indulged with this precious article. To say that a man eats salt with his provisions is the same as saying he is a rich man." This celebrated traveler suffered great inconvenience from the scarcity of salt; and any European who has been accustomed to its use, experiences a painful longing for it when deprived of it. Moorcroft and Trebeck, in their "Travels in the Himalayan provinces," tell us that the Ladakhis and Thibetans boil soda and fossil salt with their tea, of which they drink large quantities in the course of the day. It is important to be known that one of the ill effects produced by an *un*salted diet is the generation of worms. In the *London Medical Journal*, (vol. xxxix.,) Mr. Marshall has published the case of a lady who had a natural antipathy to salt, and was consequently most dreadfully infested with worms during the whole of her life. In Ireland, where, from the bad quality of the food, the lower classes are greatly infested with them, a draught of salt and water is a popular and efficacious cure. Dr. Paris has noticed the bad effects of a diet of unsalted fish. Rush says that he has administered many pounds of common salt with great success in worm cases. Lord Somerville, in his address to the Board of Agriculture, gave an interesting account of the effects of a punishment which formerly existed in Holland. "The ancient laws of that country ordained criminals to be kept on bread alone, *un*mixed with salt, as the severest punishment that could be inflicted upon them in their moist climate. The effect was horrible; these wretched criminals are said to have been devoured by worms engendered in their own stomachs." The wholesomeness and digestibility of our bread are undoubtedly much promoted by the addition of salt, which it so universally receives. Dr. Dyer says that, in the Mauritius, the planters' slaves rarely obtain salt, and are therefore extremely subject to worms, while the Government slaves and the convicts get salt in their rations, and seldom suffer from those intestinal parasites. Some planters, regarding economy and the health of their slaves at the same time, give a table-spoonful of salt in half a pint of water to each slave regularly every Saturday after work; and they find that this dose acts not only as a vermifuge, but as a tonic. A naval surgeon, who used to prescribe salt water for his patients in all disorders, happened to be drowned one evening. Next day the captain, coming on board, inquired for the doctor, and was coolly told by a sailor that "he was drowned last night in the *medicine chest*."

The fondness of animals for salt is often remarkable. Professor Gmelin tells us that a female wild ass which he brought to St. Petersburgh preferred brackish water to fresh. In their wild state, asses feed chiefly on the most saline and bitter plants of the desert, as the *kalis, atriplices, chenopodium*, &c. Bryant says they will discover distant waters by the smell; and one may infer that they do this by inhaling the saline emanations from them. Sir Thomas Bernard, in his interesting work, entitled "Ease of the Salt Duties," says—"In visiting Alderman Farley's salt-works at Droitwich, in August, 1817, I was struck with the appearance of an old black horse, that worked the machine for raising the brine. He was in very good condition, and his coat was like the finest black satin. I asked what made the horse so sleek and plump; the answer was, that he had regularly a little salt in his chaff three days in the week, about four ounces of it on each of the three days; or, if he was not very stout, then sometimes a little more; but that, in general, the horse was very well, and did his work well. He said he did not give him the whole four ounces at once, but at several times, about a table-spoonful each time. The horse had been purchased by Mr. Farley about four years ago, being then about twenty years old, and his health and appearance, though he had constant work, had very much improved since; the salt, he added, had made him eat his food, and work better." Mr. John Taylor, the agent of the London company for working the Real del Monte silver mines in Mexico, informed Dr. Paris that the ore, which consists of the sulphuret of silver, is, together with mercury, amassed in heaps with iron pyrites and common salt; and that such is the greediness of the mules employed in the works for salt, that they are constantly licking the materials; the consequence is, that a portion of the silver amalgum is introduced into their stomachs. The animals, however, suffer no inconvenience; but, after death, on opening their stomachs, it is not unusual to find considerable masses of silver, the mercury having escaped, or been dissolved by the gastric juice.

Camels, according to Mr. J. Wilkinson, will drink water which is too salt to be drank by the

Arabs. Gazelles live in immense herds upon the open plains, where they browse upon the saline and pungent herbage. The Americans call the salt springs *deer-licks*, because the deer and elks (*Cervus Alces*) frequently repair to them, not only to eat the saline herbage, but to lick the wet pebbles. They come in such numbers to these salt localities that the ground about is trodden into mud by them.

Pliny only alludes to salt as a beneficial ingredient in food for grazing. In his "Natural History," Book xxi. chap. 7,) he tells us that cattle have an avidity for a salt pasture, and that cows fed thereon give more milk, and much better for curding into cheese, than upon ground not of a saline nature. In some parts of Africa, large herds of cattle travel from great distances, at stated seasons, to enjoy the marine plants which grow on the coast and are saturated with sea salt. The fattening property of our own salt marshes is well known to graziers and farmers. In Smith's "Wonders," it is stated that the water of the salt mines near Eperies, in Upper Hungary, afford "a blackish salt, which is generally given to cattle." For many years, it has been the custom in Germany, and particularly in Wirtemberg, where a vast number of oxen are bred, to give doses of glauber salts to cattle. As long as common salt is more expensive than glauber salts, it was thought that the inhabitants of Wirtemberg used the latter through economy, but this supposition must have been erroneous, as they still continue to use glauber salts, although the discovery of salt springs has rendered the domestic salt exceedingly cheap.—The reason they assign for this preference is, that it conduces, by its purgative qualities, to keep the cattle in good health, and that even when, from long habit, they become less liable to be acted on by it, it still promotes digestion, and brings the beasts into good condition more rapidly. Two doses are generally given each week. A horse has an ounce and a half; an ox or a cow receives an ounce; and sheep three quarters of an ounce; and a pig about half an ounce. Should its purgative effects prove too strong, the dose is diminished. There is no trouble in administering the salt, as it is merely sprinkled over the food. The price of it in Germany is a mere trifle, as the mines of Bouxviller, in the department of the Lower Rhine, furnish it from the manufacture of ammonia in great plenty. Matthew Aphonin, a Russian naturalist, remarks that "oxen fatten very quickly upon the sea-coasts where the arrow-grass, (*Triglochin maritimum.*) their favorite food, abounds;" and if this be so, it is probably ascribable to the saline nature of the plant, and to the sea-breezes containing particles of salt, which appears to be necessary to stimulate their digestive organs, and therefore conducive to their health. In Upper Canada the cattle have plenty of wild pasture to browse on in the woods, but, once in a fortnight they return, of their own accord, to the farms, to obtain a little salt; and when they have eaten it mixed with their fodder they repair again to the woods. D'Azara tells us that in some parts of Paraguay, salt is not given to the herds of cattle; but they are supplied with the *barrero*, (a saline or nitrous earth, which they and other animals seek with avidity, and without which they fail and die in the course of four months. From the 27° of south latitude to the Malovine Islands, they have no need of the *barrero*, because the water and pasture-grounds are sufficiently salt; but northward, beyond this latitude, it is necessary, and the plains which do not contain it feed neither the ox, horse, ass, mule, goat, or sheep.

Dickson, in his "Husbandry of the Ancients," tells us they were accustomed to prepare the straw for feeding stock by keeping it for a considerable time steeped in brine; that it was then dried, rolled up in bundles, and given to oxen instead of hay. In Spain, the practice is of great antiquity, (for we remember reading of it in some Latin author,) and in the low countries, where they have no traditional data to ascertain its first introduction among them. Dr. Brownrigg, in his "Art of Making Common Salt," (1748.) remarks that "salt provokes the appetite, strengthens the stomach, promotes the concoction and digestion of the aliments, &c. and is most friendly and agreeable to the human body. Moreover, black cattle and sheep take a pleasure in licking it, and by it are preserved from many diseases; they also thrive to admiration upon it." The *Museum Rusticum* (1763) confirms this by the practice which had long before been pursued in America, "where," says the American contributor to the above work, "we think it in a manner absolutely necessary, and, accordingly, give it to almost every kind of cattle, and those with parted hoofs are particularly fond of it. To this practice of feeding with salt it is generally ascribed that our cattle are so much more healthy than the same animals in England; certain it is that they are subject to much fewer diseases." The first experiment as regards sheep, instituted in England, seems to have been in 1801, on the estate of the Board of Agriculture. Lord Somerville's account of this experiment is exceedingly interesting and important, and too little known. "The salt," his Lordship relates, "is given in the morning when the sheep are looked over, in order to counteract the ill effects of the dew. On an average, one ton of salt is annually consumed by a thousand sheep. A small handful of salt is put on a flat stone or slate; and ten or fifteen of these slates, set a few yards apart, suffice for one hundred sheep. At first, the sheep may be moved toward them; if they feel a craving for salt, they will lick up quickly as much as is necessary; if they do not want it, what remains dry when the sheep are next looked at is taken up and reserved for future use. Twice a week has been usually found sufficient; in particular cases it may be offered thrice. Of a flock approaching to one thousand, there are not ten old sheep which have not taken kindly to it, and not a lamb which does not consume it greedily.—When turnips, in the early season, are stocked with sheep, and the greens are rank and strong, many die suddenly, especially two-toothed sheep; the disorder arising from excess of fermentation in the stomach. In this disorder, hay and salt are devoured with a greediness that denotes their salutary effects. In the rainy and unfavorable autumn of 1801, we did not lose one sheep in turnips, and, probably, *never shall*, while we persevere in the use of salt. In the autumn of 1802, we had many hundred fat wethers, ewes, and hog sheep, in turnips, and lost two the first month the turnips were stocked.—Certainly the chances were that in any keep, and any season, more might have died out of so large a flock. In strong pastures, when seasons are wet, the rot often spreads destruction over whole tracts of the country; in such a case, salt must be beneficial, and an object of national importance. It is supposed, and with great truth,

to correct acidity in the stomach—a disorder common to sheep even in Spain, but of a much more serious nature in the damp climate of Great Britain, more particularly when stocked on green, floaty food, such as turnips, vetches, and young clover. Salt may not be a specific on land naturally unsound—such land it is madness, at any rate, to stock with sheep: but where the rot occasionally prevails, those who have carefully noted how salt affects cattle, can hazard little in supposing that the disease will be much less heard of when such a corrective is applied." There can be no doubt that salt is a great preventive of the rot, and of those parasitic creatures called *flukes*, which attack the liver of the sheep. The flocks that feed on the syenetic hills of the Cheviot, and adjacent and similar soils, the shepherds say, may pine, but cannot rot. "In visiting Mr. Mosselman, who occupies a large farm on the Continent, I was surprised," says Sir John Sinclair, "to find a quantity of rock salt from Cheshire. He assured me that, by allowing the sheep to lick it, the rot was effectually prevented." In Spain, salt is given as a medicine for the rot. Sir John also tells us that a Mr. Bracebridge "drenched some rotten sheep, night and morning, with strong brine, after which he did not lose one; they became fat, and the meat was fine and good, as if the animals had never been affected." Mr. Curwen says that, after his first trial of salt upon sheep, out of fifty shearling Devons which he killed, there was not one unsound; whereas, previous to the use of salt, it was rare to find a liver that was not more or less tainted. In short, salt keeps a flock healthy, does no harm, and the expense of providing it is but small. The Saxons and Spaniards attribute the superior fineness of their wools wholly to their liberal use of salt. Every sheep ought to have two ounces of salt per week, spread very thin upon tiles or slates in the field.

To cold-blooded animals, inhabiting the land and fresh water, salt seems always to prove fatal. The Prince of Musignano, an able and celebrated zoologist, says of the warty newt, (*Triton cristatus*, Lawr.) that if a little salt be sprinkled upon it, it dies with the most violent convulsions, although this amphibian is generally so highly tenacious of life. Salt proves equally fatal to earth-worms, snails, slugs and insects. Hence salt and water, poured over gravel walks, preserves them in good order, by destroying the worms whose earth-casts are so unsightly. To destroy insects, salt is best administered with a garden syringe. [Jour. of High. & Ag.Soc. of Scot.

ON THE CURING OF PROVISIONS FOR THE BRITISH MARKET.

L. Tucker, Esq: The curing of meat is a business we are daily engaged in; an art attained by precepts and founded on principles, the knowledge of which is of immense importance not only to the health, but to the comforts and economy of man; yet strange to say, it is a science about which not one word has ever been written; and that we look in vain through the printed masses of the new and old world, for a single treatise upon the subject. When you reflect upon this fact, you and your readers will, I trust, be lenient in your criticisms on this, *my* first attempt at a *first* essay on the subject; more particularly when I tell you, I am prompted by no other motive than to increase the value and interest of your invaluable publication: to instruct your readers, and to open the eyes of the many persons engaged in the business to the minutiæ that must be observed, and the difficulties that must be overcome, in order to pursue the trade successfully.

Ude, in his celebrated book on Cookery, in giving instructions how to make hare soup, significantly says, "first catch the hare." It is not of more importance to catch the hare to make the soup, than it is, in putting up beef for the British market, to first get the beef of the right size and quality. The quality is found among the fattest and best fed cattle you can obtain; and the size must range between 600 and 800 lbs.—being that which invariably cuts up to the best advantage; having more prime pieces, both in weight and number, compared with the whole weight of the carcass, than any other size we can select. Having obtained the cattle, our next care must be to have them properly killed, and here it is of great importance to your success in curing, that not only the blood of each animal should be well and thoroughly drawn, but that every animal should be allowed sufficient time to rest off its journey—say from 24 to 48 hours, according to circumstances—so as to allow the fever consequent on driving any distance to subside before you kill it.

The business of packing is divided into two parts; the first is to cure the meat—the second is to preserve it when cured. In the packing-house, the first preparation that should be made for business is the making of the brine in which the beef is to be cured. By way of parenthesis, it may as well be here noted that neither Kanawha, Zanesville or Goose Creek salt should be allowed to touch your meat, either directly, by mixture with other salt, or indirectly through the medium of brine; for so sure as any of these salts are used, so sure will your meat become slimy like fish, and be imperfectly cured. The best salt I know of, for curing, is the Liverpool coarse sack salt, as it is called. The brine should be made for at least 10 or 14 days before it is required; it should be made in large vats or hogsheads with a sufficient quantity of finely powdered saltpetre added, to give the beef that red color which so pleases the eye from long habit; it should be allowed to settle down and refine, and, when drawn off into the tubs where the beef is to be cured, it should be clear, and entirely free from any sediment or impurity.—The strength should also be tested—which, in the absence of a regular brine tester, may be

done accurately enough by placing the half of a hog's head, weighing from 7 to 8 pounds, in the brine, which must float *perpendicularly*, the snout two inches above the surface, before the brine can be pronounced strong enough.

The next operation in the packing house is the cutting up of the beef into 8-lb. pieces, about which it is impossible to give any specific directions, as the number of pieces must entirely depend on the size, weight, and thickness of the animal. This department of the business must be guided by the hand and eye of the practical tradesman, and directed solely by his good judgment. One thing may here be remarked—that it is always well to leave two prime pieces of every carcass, say off the standing ribs, whole and uncut, to weigh from 32 to 38 lbs. and cured in that way, for two reasons: first, when cut up to the proper size after they are cured, it leaves a freshness and bloom on those pieces for the heading, which gives to the purchaser, on opening the tierce for inspection, a certain guaranty that the meat was handled by a tradesman; and secondly, it will facilitate the scaling of the meat much, as should 37 pieces be in the scale, wanting one piece more to weigh 8 or 10 lbs. more or less, that piece can be cut off this larger one to a great nicety, and avoid the delay and trouble of tossing a pile of meat over to hunt up one piece from the many, of the exact weight wanted. In scaling your meat it is not necessary to put more than the exact weight, 304 lbs. in, as beef, when cured, and put into tierces, will regain fully 5 per cent. of the 10 per cent. it will have lost in the process of curing.

As your beef is cut, the coarse pieces of the fore quarter, such as the clods, stickings, and shoulder pieces, should be selected and well rubbed with dry salt, and put into pickling tubs by themselves; the round, rump, and jump pieces of the hind quarters should in like manner be selected, well rubbed with dry salt, and put into pickling tubs by themselves, and then your prime parts, such as ribs, sirloins, plate and brisket pieces, should be selected, and put into the pickling tubs by themselves, and *without being rubbed*. Those pieces being the most tender and least veiny parts of the beef, will cure more easily and quicker than the coarser parts, but after remaining a week in the brine they should be drawn, and if the brine has not sufficiently stricken, then and not till then, should those pieces be rubbed with dry salt.—The coarser pieces should be drawn and examined every fifth day at least, and if the salt should not have sufficiently stricken, and the impurities be not well extracted, then they should be *gently rubbed* a second time, and the air allowed to act for an hour or two at least, on the meat and salt, before they are returned into the brine; the whole of the meat in the curing tubs must be well covered with brine, and the air entirely excluded from it.—Under a good state of the atmosphere, and with proper handling of the meat, it will be cured and ready to put into the tierces in from 14 to 16 days, but of this the practiced eye and hand of the tradesman can alone be the judge, for I know of no words to explain the feel and look of meat when cured, or when not sufficiently cured; practice and comparison alone, aided by close observation, is the only certain way of arriving at that judgment.

The propriety of sorting the meat of the three qualities as pointed out, and having each quality cured separately, I shall endeavor to explain, so as to be understood and appreciated by every person possessed of any common sense and experience. First, the finer or middle pieces of every animal, it is well known, are much more easily cured than the coarser pieces of the extremities of either the fore or hind quarter, hence the propriety of keeping them separate, as nine times out of ten it is wholly unnecessary to do more to them (the finer pieces,) than simply to place them in the brine, where they will cure without any rubbing, while it is necessary to rub the other pieces once at least, and sometimes oftener with dry salt, in order to extract thoroughly those impurities which the *lean* of every animal contains in a very much larger proportion, than the fatter part of the same animal does; and it is, for the same reason, right and necessary to separate the pieces cut off the extremity of the fore quarter from those cut off the extremity of the hind quarter, because the meat of the fore quarter contains more of those impurities, which must be extracted before it is cured, than does the meat of the hind quarter, and consequently the meat of the fore quarters requires more care and handling in order to cure it, than does the meat on any other part of the carcass of the animal; hence this classification will enable the curer to give to each sort of meat the required handling necessary for its preservation, without interfering with the other parts, which, if treated in the same way, (I now speak of the finer pieces,) would have their natural juices extracted, become hard, and what is commonly but erroneously called over-cured. There is also another reason why this classification should be made; it is this: That it saves much time and labor, when the meat is selecting for the scale, by having each quality in separate bulk; the selector has but to go to either, in order to lay his hand at once upon the particular piece he wants, without losing time or wasting labor in tossing over a pile of meat promiscuously cured.

When your meat is cured, the next process is the packing it away for preservation into the tierces, about which I deem it unnecessary to say anything; because when the meat is selected and scaled, the packing is a mere mechanical process, in which a man can alone become a proficient by practice and experience. It may be well, though, to remark that when your meat is taken out of the curing tubs, it should be washed, and ridded of the impurities extracted by the salt, and generally in a greater or less degree deposited on the surface, and which can be best and most easily done with the aid of water and a good hickory broom; the packer should always have by him a knife, and whenever he observes an incrustation of those impurities on the meat, which the washing had not taken off, he should use his knife to scrape it off, and if scraping did not effect it, he should cut it off.

When your tierces are packed, they must then be headed and thoroughly driven down in their *wooden hoops*, rolled by, and each tierce have its bung-hole bored, and then brined with pure, clean brine, made and tested in the way before described, except that *no saltpetre* should be put in it. It is of the utmost importance that this brine should be made several days before, in order that not only the impurities of the salt, but those of the water also, should have time to settle down into a sediment, and this sediment should not be disturbed when the brine is drawn off. The want of this precaution has

been the cause of much complaint and injury to the meat when exposed for sale, from the fact that when the brine was put on without first being allowed to clear itself, the impurities of both the salt and the water settled upon the meat, and made it both slimy and dirty. The tierces should remain at least 14 days in this state with the bungs open, and whatever the casks may have absorbed of the brine, should be replenished once, if not twice, every day, and this continued until the casks will absorb no more, and that the brine remains as stationary and undiminished, when filled, as though it stood in a glass bottle. The necessity for this precaution is obvious: first, if your staves are not in this way allowed to become saturated with brine, and the brine replenished, before the casks are finally coopered and shipped, you can have no guaranty for your casks not leaking on the voyage; and secondly, should this absorption be allowed to take place on the voyage, your tierces in a short time will become half empty of brine, and wherever your meat then comes in contact with the stave, it will extract from the wood its coloring matter—will become stained and discolored, and for the want of brine, the meat will become hard and rancid, and perhaps mouldy too. Your tierces after standing at least 14 days will take no more brine. They are then ready for the bungs, which should be put in with a coarse cloth around them, and tightly driven; over each bung a piece of tin should be nailed on, but great care must be observed that the tacks with which it is fastened are so short as not to go through the stave; as, if they do, a leakage will take place that may do much harm.

Then comes the finishing stroke to the whole, namely, the putting on of your iron hoops, and the final coopering of your tierce. As few coopers are in the habit of doing such work in the United States, I shall explain the process, so that all may understand and perform it, if they will. In the first place, care should be taken to clean your house of all salt and brine, in order that the hoop-iron may be kept as free from it as possible, to prevent its rust and corroding. The tierce up-ended, the cooper takes off the first three wooden chime hoops, he then takes his hoop iron and bends it round the place of the *first* hoop, and takes its accurate measure; there he then cuts it to the length, and rivets it, which can only be well done on the face of a small anvil, or on the side of a metal half-hundred weight; he then puts this hoop on, (having eased it, by a few blows on the inside of one edge, to the shape of the cask.) and drives it to the berth of the *second* wooden hoop, leaving room for a wooden guard-hoop on the outer edge of the chime; he then strips that end of the tierce of all the remainder of its wooden hoops, and takes his hoop-iron and measures around the berth of the *third* wooden bulge-hoop, cuts, rivets and shapes it, and then puts it on and drives it down to the place of the *second* bulge-hoop; this done, he then puts on his wooden guard bulge-hoop, which passes over the iron one, and drives it to its place, and then drives on the remainder of his wooden hoops, finishing with a guard chime-hoop outside the iron one, and so proceeds on until the whole is coopered. It is necessary here to remark, that no iron driver, used perpendicularly, as coopers use their wooden drivers on wooden hoops, will ever drive an iron hoop to its place. There is a proper driver without which the hoops cannot be driven; it is this:

B, the handle; *a*, the head on which the blow is given, and *c*, the bite which catches the edge of the hoop; this, used with a 7-lb. hammer to strike with, will drive any iron hoop to its place, but without it, the hoop cannot be stretched and driven, and consequently must remain imperfect.

The curing and packing of pork differs somewhat from that of beef; but the length to which this article already extends, prevents me from going into that subject at present, nor is it necessary to be known to the community, for from my knowledge of the trade, of the quality of the Irish pork, and of the manner and cheapness with which it is produced, I deem it impossible for us in the United States to compete in any market with the Irish pork, with the hope of realizing a profit for some years to come, under the present Tariff; nor can we count with certainty, even under the very best possible management, upon any profit being realized by putting beef up for the British market this year, at the prices now paying for fat cattle in this, the great beef producing country of the United States.

At some future period I may again address you on this subject, which is of such interest and importance to the whole of our community here. I remain, sir, with respect, yours, &c.

AN APPRENTICED PACKER.

Louisville, Ky. 4th Nov. 1845.

SOME EXPERIENCE WITH GUANO IN VIRGINIA THE LAST SEASON.

Extract of a letter from a gentleman in Maryland.

"We have a fine trial of Guano on the Alms House Wheat which I will show you when you come on. Mr. T. S. Pleasants writes me from Petersburg, Va. 20th inst. wanting to purchase more Guano of Mr. George, and remarks: 'I have never been able to collect the results of any exact experiments with Guano, or I should have forwarded them to thee with a great deal of pleasure. Some of those persons who tried it on wheat, thought the increase was very considerable. Dr. Dupuy, according to the best estimate he could make, thought the increase of his was not more than thirty per cent.; Robert Strachan thought his was enough to pay for the Guano three times, but the season was every way unpropitious for its action, and whilst some persevere, many more are not disposed to try again. Although the past season has been so discouraging to those who have used Guano, I cannot say that my confidence in its virtues has been impaired, and I feel no hesitation in making another trial. For the very early and the very late crops, its action has been beneficial, but for those which usually mature during the summer and early part of the fall, its application was attended with no benefit; indeed, in some cases, as in that of hot fresh manure, some injury might have resulted. My crops of cabbages, of which I raise a good many for the market, are very fine and grown entirely with Guano.'"

A SKETCH OF BELGIAN HUSBANDRY.

The farms in Flanders are small, the average size being not more than fifty imperial acres. Some are held on lease, others are not. The terms vary from three to fifteen years, some multiple of three as far as fifteen being the duration of a lease. In some the tenants have it in their power to quit at the end of every third year, while the landlord cannot put him away till his lease is out. It is impossible to say what the average rent of the farms is; but so far as I could ascertain, it may be stated at 30s. the imperial acre, for the best soils, exclusive of burdens, which are generally one-fifth of the rent.

The farmers of Belgium are a hard-working class of men—in the habit of laboring their farms, and generally ignorant of every other subject but their profession. But in it truly they show rare sagacity and experience; and though unaided by, and almost despising, the light of science, they discover in some parts of their system of Agriculture a perfection to which science has never yet guided the farmers of this or any other country. When we look back to the ancient grandeur of Belgium, when its cities were the marts and factories of Europe, and consider the consequent increase of population in a country naturally unproductive, we will discover a sufficient stimulus to excite the energies of a people gifted by Nature with an indomitable perseverance and unwearied industry. This disposition, as well as its effects—their Agriculture—has been handed down to the present generation of farmers, and still manifests itself in many operations which the negligent farmer would consider unprofitable, or, at least superfluous; and it is from this praiseworthy industry that Belgium, comparatively a poor country, is considered by strangers as unrivaled in the salubrity of its climate and the fertility of its soil, and that the great part of the kingdom is prevented from returning to its original barrenness.

The number of servants who live on the farm throughout the year may be stated at six to the fifty acres, and these are paid as follows:—The men who perform the work of plowmen and laborers receive 10s. a month with their meat, which the farmers value at 6d. or 7d. a day, thus making the full wages of a man equal to 25s. a month or £15 a year. Their food consists of boiled milk and bread for breakfast, soup or butter-milk and bread and butter for dinner, with potatoes and pork five times a week, and bread and milk for supper. The soup used is composed, according to Mr. Radcliff, of butter-milk boiled and thickened with flour or rye-bread, potatoes, salt fish, various vegetables, and eggs. They work from daylight till it is nearly dark at this season of the year, which, after deducting the hours of rest, will be about ten hours a day. In summer it is longer. The women, who are hired to live on the farm, receive about 4s. 6d. of wages less in the year than the men. It may be observed that almost all the farmers take the same food as their servants. The day-laborers, who are only employed at certain seasons, such as for weeding the crops and engaging in the operations peculiar to flax culture, receive 7d. and 8d. a day, with their meat; and boys and girls have 5d. with their meat. An ordinary working-man will live very comfortably in a town in the south of Belgium, paying £15 for victuals and £2 for the rent of one room for the whole year.

The farm-buildings are generally built in the form of a square, and consist of dwelling-house, byre, barn, stable, servants' sleeping-room, and cart-shed. The middle of the area included in the square is several feet below the level of the houses, and is admirably adapted for saving manure. The greatest cleanness prevails in every department of the steading.

The strength of horses kept on a farm is at the rate of a pair of horses to the fifty acres. And the number of animals supported altogether on the farm far exceeds anything we are accustomed to in this country. This, indeed, is one of the secrets of their farming; and we have no hesitation in saying that, in this particular, they excel the farming of any country with which we are acquainted. The keep of a horse is estimated at 20d. a day. It is generally fed during the winter on oats, straw, beans and hay; and in summer on cut grass. The horses are small, but compact, handsome, with beautiful action, and high-spirited. As no attention has been paid to the improving of their breed of cows, they are not distinguished for any excellences. They answer the purpose of the dairy, for which they are principally kept: they are generally black and white in color. After being for some years in the dairy, they are fattened or sold lean to the butcher, who is generally feeder as well as butcher. The most of the beef used in Belgium is that of these old cows. They have a practice by which they ensure the regular feeding of the calves, which they consider essential to quick fattening. Immediately after they have got their usual quantity of milk, baskets are put on their mouths, to prevent their eating anything in the interval between the feeding times. Few sheep are kept, and these are of the worst description.

The fields are small, and are divided merely by ditches. There is no such thing as a hedge or dyke enclosing a field. These, from the peculiar management of the stock on their farms, are quite unnecessary. But where thorns are used as fences, as around nurseries and gardens, the settings are put very closely together; and, after they have sprouted up a certain length, sticks are run along horizontally, and the young shoots are tied to these, so that in a short time, from the intertwining of the shoots, now grown into branches, the fence becomes quite impenetrable. Under-drainage is never practiced. Much of the soil does not require it: but to facilitate the drying of the fields, and to draw off the surface-water from the plants, a spading of earth is taken out from every furrow, and scattered over the ridge, so that, in a heavy shower, the rain-water finds a ready course to the ditches which skirt the fields.

One of the points in which the Flemings show their skill of management is the attention they pay to the working of the soil. Unless the soil has been thoroughly pulverized by repeated plowings and harrowings, they forbear from sowing any crop. To this, in particular, among

other causes, we must attribute the practice prevalent there of using small quantities of seed, and the beautiful, healthy, and equal brairds which cover the surface in spring. In many places they are not content with the mere use of the plow for this purpose, but resort to the spade also, either in giving an additional depth to the furrow, or in turning the whole soil over with this implement. In the province of Antwerp, we mentioned before that the spade was far more used than the plow for agricultural purposes.

An operation seen daily at present is the picking of the weeds from the young crops. Often the land is raked well before the workers commence their operations, for the purpose, as the farmers allege, of separating the plants, that the weeds may be more easily distinguished. But there is evidently another and more beneficial effect, the raking will have upon the crops. It will loosen any crust that may have been formed on the surface, and thus admit of a more ready access of the air to the roots of the plants and the quantities of manure which are covered by the soil, thus aiding their action by a supply of oxygen. Some may object to the raking, from its exposing the plants to the action of drouth; but the good derived from it, for the reasons stated, is more than sufficient to counterbalance any risk from drouth. After the raking, the workers go over the whole field on their knees, picking out every useless plant. This is perhaps repeated several times in the season, according to the state which the field is in. Flax costs far more labor in weeding than any other crop; and the Flemings spend double time on it from the importance of the crop. A Scotchman, ignorant of Agriculture, in passing through Belgium at this season, and seeing an extended row of women creeping on their knees among the young crops, and looking with the greatest care for injurious weeds, would be apt to extol the industry of the people, while he would accuse his own countrymen of indolence and carelessness in the minute, but no less important, points of husbandry. But he would be doing his own countrymen an injustice, in as far as he would condemn them for their non-performance of what they do in a more economical and as effectual a manner as is to be met with in Belgium: we allude to the practice of drilling grain crops, by which means the weeding of the crop is far more expeditiously accomplished than it is by the plan resorted to in Flanders. This careful attention to the weeding of the grain crops is the more necessary in Belgium, where they are all sown broadcast; the soil is of that class which encourages the growth of annuals, and summer fallow or green drilled crops form rarely a part of their rotations.

The implements used in Flanders are so simple and rude that they scarcely deserve mention. There are two kinds of plows employed; one which is held by one hand only, and is of the rudest construction; and the other, called the Walloon plow, in which the body is attached, by means of its beam, to a framework on wheels, which connects it with the horses, and regulates the different depths to be plowed. In this the mould-board is movable, and is changed at the end of every furrow from one side to the other.

The next subject of which we shall speak is the manures of Flanders; and some conception of the importance of this subject may be formed, when we mention that it regulates, not only the whole, but every individual part of the management of a Flemish farm. The first object and great aim of a Flemish farmer is to make or get manure; and to carry this into effect, nothing that can contribute in the least to increasing a dung-hill is thrown away. He cultivates food for cattle, and ties them up all the year round, that he may not lose any of the manure. He sows rape, and allows it to blossom and ripen, that he may obtain the seed for manure. His ashes-cart and urine-barrels traverse every street in a town, every by-way in the country, to collect this important necessary for his farm. It is in their management here that the farmers of Belgium excel those of every other country, and are thus enabled to extract more from the land than any other body of farmers. They act up, in short, to the true old adage that "Muck is the mither o' the meal kist." The principal manures used are farm-yard dung, urine or liquid manure, rape-cake, and ashes. Minerals are seldom, if ever used, and bones are almost unknown. I alluded before to the comparatively great number of animals kept by the Flemish farmers on their few acres. This they do principally for making manure, to enable them to carry out their system of farming. On a farm of 63 acres, 3 horses and 15 milch cows, and several heifers for supplying the stock were kept throughout the year, besides 6 cows and a few calves that were fattened yearly. In another, of 77 acres' extent, 4 horses and 20 cows, with a requisite number of heifers, were kept, besides from 20 to 30 calves being fattened off yearly; and in a third, of 88 acres, 5 horses and 20 cows, besides heifers and calves, were kept. These farms were all arable, and were situated in one of the finest districts in Belgium. Mostly every crop receives some of this farm-yard dung, which is always well rotted before being applied. One of the peculiarities of the Flemish system is, the extensive and various uses they make of the urine from the animals kept on their farms. Every one has heard of the urine-tanks of Flanders, which are to be found all over the country, at home, and in the fields. They are built in a most substantial manner, and so far under ground, that when they are covered in, the farmer is enabled to cultivate the soil over them. Contracts are generally entered into between the farmers and those in towns who have much of this at command, such as brewers, distillers, &c., who fatten animals from the refuse of their works. £2 ($10) is *commonly given for the urine of one animal for a year.* The farmer, at stated periods, conveys, by means of barrel-carts, what is collected in towns to his subterraneous receptacles at the corners of his fields, to be ready for the seed time. The crop to which it is principally applied is flax; and then they dissolve in it rape-cake, which renders it a most powerful manure. After the flax-seed has been sown and covered in, and rolled, so that the surface is made quite smooth, they proceed to apply this mixture. It is applied in the following manner:—Five men are employed altogether, two to pump, two to scatter it, and one to drive it. A rectangular piece of ground, thirty yards in breadth, is measured off across the ridge; this is sub-divided into six portions of five yards each. The field was laid off in ridges of ten yards. Six wooden vessels are filled, and placed in the middle of a ridge, at a distance of five yards from one another; so that the contents of each vessel, which is about the size of a potato firlot, is the allowance for

every fifty square yards. There is nothing in which they manifest such economy as in the saving of this material, which they prize as a most valuable assistant to their labors. Rape-cake, besides being applied, as mentioned above, with the liquid manure, is also used in a dry state. The rape is cultivated principally as a manure, and is used extensively where the cropping is very severe. Ashes are never used but as a top-dressing to clover; but the traffic which is carried on in them, between Holland and Belgium, is sufficient to form a distinct trade with a certain class of merchants in Belgium. The farmers in Belgium set a high value on them, and place so much dependence on them for the success of their clover-crop, that (I understand from what I have read) there is a current saying among them, that "He who buys ashes for his clover-crop, pays nothing; but he that does it not, pays double." It is really surprising that this manure, which has been proved to be so efficacious by a class of experienced farmers like the Flemish, has never yet been tried, or at least sufficiently tested, in Scotland. I believe some were imported in the beginning of this year by Messrs. John Mitchell & Co., in Leith; but I am not aware that they have met with the reception we would anticipate from the well-known successful results of their application in Belgium. There is nothing so much wanted at present, in the Agriculture of Scotland, as a good lasting top-dressing for clover. The failures in this crop have been frequent of late, and the effects of nitrate of soda last only with the crop to which it is applied, while sad disappointments have been experienced in the use of gypsum. But before recommending an extensive use of this material, I would suggest a few comparative trials to be made with it, gypsum, soot, and other substances; for if the failure of gypsum arose from there being a supply of it already in the soil sufficient for the growth of the plant, an application of Dutch ashes might be attended with a similar result, as the great proportion of the ingredients of the ashes are salts of lime, with the useful addition, however, of some salts of soda. Some attribute their great effects in Belgium to the lime which they contain, as few of the soils there have any amount of lime in their composition. They are applied in different quantities to the soil, from ten to thirty bushels an imperial acre.

The crops raised in Belgium are wheat, oats, rye, flax, potatoes, rape, and clover, as principal; and, as secondary, turnips, carrots, buckwheat, tobacco, and spurry. The farmers consider flax and rape the best paying crops they cultivate, and they are the most exhausting; hence the enormous quantities of manure given them.—The rape is sown in July, transplanted in September, and cut in June of the next year. The clover, which is grown for seed as well as for food for cattle, is an important crop with the Flemish farmer. He is not particular among what he sows it. We find it growing amongst flax, wheat, oats or rye. There are two varieties of rye used, winter and spring. The winter variety is almost always sown after potatoes in December, and some of it is cut green in spring, before the clover is ready for cutting. It thus answers the purpose of early tares in this country. Another crop is taken the same year, after it is cut. The ground is plowed several times for potatoes. When the last plowing is finished, the furrows of which are about seven inches wide, one man walks up one of the furrows, and, with an instrument similar to that used for picking up turnips, makes a hole, into which a boy drops the cutting of a potato.—Eight inches farther on, another potato-set is put, in making the hole for which he draws the soil over the previous setting. This he does every second furrow, so that the distance between each row of potatoes is not more than fourteen inches. One man and a boy do about 450 yards in this manner in an hour. The turnips are almost always taken as a second crop in the year. Immediately after the rye is cut, they begin to prepare the land for turnips; and, by the powerful agency of the liquid manure, a beautiful braird is obtained in a few days. The turnips have attained a pretty good size when they are pulled, and, with the potatoes, form the winter food for the animals on the farm. Carrots are often sown with flax, so that they are enabled to have two crops the same year from the land; for by the time the flax is pulled, the carrots are considerably advanced. This method of double cropping is very frequent in Flanders, and is another instance of what, by economy of manure and a judicious application of it, they are enabled to produce from the soil.

The next subject which comes naturally after this is the rotation of crops practiced in Flanders. I was prepared, before crossing the channel, to encounter some little difficulty in this subject, from having read of the great variety of rotations to be found there. Every field, Mr. Radcliff tells us, has its own rotation. But the four, five, or six years' course to which we are accustomed in this country, made me form but a faint idea of the difficulties of comprehending the Flemish course; and therefore, when I began to study them, these exceeded my greatest anticipations, and every day that I renewed my inquiries but plunged me into greater perplexities. I could perceive no fixed principle on which they founded their constantly varying rotations. The same farmer would give me one day one rotation, and the next another totally different from yesterday's, as the rotation he practiced on his farm; and were I to transcribe all the various systems I jotted down in my note-book, as those followed on farms within the narrow compass of a few miles, I would fill as many pages as this short sketch of Belgian farming would require. With such conflicting statements, and with no prospect of unraveling the mystery, I began to solace myself with the thought that the Flemings had no such thing as a rotation; that they knew the value of a change of crops each year, and therefore they practiced a succession rather than a rotation of crops. If they are rotations, it is difficult to tell where they commence and where they end; and they are, besides, extremely long. The principle they seem to go upon is, that the same crop shall not be taken two successive years from the same land. And on examining my heterogeneous mass of rotations, I have been enabled to trace out the few following facts:—That wheat and rye almost always succeed potatoes; and rye, potato wheat: the place of flax seems to be after oats, and before wheat or rye. Clover is sown with any of the principal crops. Rape seems to succeed oats or rye. I think I cannot do better than conclude this part of the subject in the words of Mr. Radcliff:

"In Flanders they would consider their industry and their manure inefficacious without the aid of a precise and well-regulated rotation; hence the variety of successions which we ob-

serve at every variation of the soil. They have been farmers time out of mind, rotation farmers for centuries: *there is not a cultivated acre, the proprietors of which are not matter of notoriety; and according to those properties, the most suitable succession and the most profitable application of manure have been long since resolved on, and are now invariably practiced.*"

It may not be out of place here to introduce the management of a farm in the high country, or Walloon district. The farms there are much larger than in the low country: 150 acres are there considered a small farm, and many of them are 1,000 acres in extent. The size of the farm about which I obtained most information was 200 acres. The whole of it was under the plow, but twelve acres of meadow. There were only three plows used: but twelve horses were kept, and used for farm work alone. The cause of this great number of horses is, that they never put fewer than four horses, and often six, into their wagons. They have, besides, twelve young horses of different ages, and fifteen cows, which is the whole of the stock kept on the farm. The rotation is generally potatoes, wheat, rye, oats, with clover sown with one or other of them. When we speak of this being the rotation, we do not mean that it is followed with unaltered regularity; for the most profitable crop here is wheat, which the farmer endeavors to grow on a third of his farm. They are near lime here, of which they avail themselves, by applying considerable quantities to the soil. I saw some applied as a top-dressing to young clover. Ashes are also used for the same purpose; but they are much redder in color than those I saw in the low country. The coal burnt here is always mixed with clay, to bind the pieces together, as it is all in small pieces, the largest not being larger than a hen's egg. This may cause the red color in the ashes referred to. They are not so careful of their manure as in Flanders, nor does the same attention seem to be paid to the land. Wages are much the same as those mentioned before.

This is a rough outline of Belgian farming, from personal observations there. I must admit that there is much that might be very profitably introduced and mingled with Scottish husbandry. A little more latitude and variety in our rotations would, while it would increase our productions, benefit the soil. But such a change would have to be introduced with caution, as otherwise it would shake the whole fabric of our Agriculture, which rests so firmly on its present foundation: and while we would cull out the excellences of Flemish farming, and engraft them on our own system, we would not commend it as a whole. And he who would attempt to introduce it into this country, either as a whole or in certain of its parts, would not only expose himself to ruin, but prove himself ignorant of the different states of the two countries, and of the first rudiments of good farming. P. M'L.

[Jour. of High. and Agri. Society of Scotland.

HOUSEWIFE'S DEPARTMENT.

THE FLOWER GARDEN.

FLOWERS are the ornament of vegetable existence, and have in all ages been cultivated by persons of leisure and taste, for the pleasure which they yield to the eye and the fancy. While generally healthful and exhilarating from being pursued in the open air, flower-culture is justly reckoned to be a pure and harmless recreation, which, by leading to the tranquil contemplation of natural beauty, and diverting the mind from gross worldly occupations, has a positively moral and therefore highly beneficial tendency. It has also the advantage of being alike open to the pursuit of high and low, the peasant and the peer, the over-toiled man of business and the industrious artisan. It may be followed with equal enjoyment by individuals of both sexes, and, as is well known, on every imaginable scale, from that of a single flower-pot or ornamental border, to the princely green-house and exquisitely varied parterre.

The natural grace, simplicity, and attractive coloring of flowers, have afforded endless themes to moralists and poets, and volumes have been penned to show how many associations of feeling, simple and sublime, these beauteous objects are calculated to excite. As our desire is to improve the feelings as well as to instruct the understanding, we hope to escape blame for pausing an instant over this agreeable view of the value of flower-culture, and would refer, for one of the most glowing eulogies on the subject, to the elegant work of Miss Sarah Stickney—the *Poetry of Life*. According to the well-expressed sentiments of this lady, few natural objects are more poetical, or more calculated to refine the taste than flowers: "From the majestic sun-flower, towering above her sisters of the garden, and faithfully turning to welcome the god of day, to the little humble and well-known weed that is said to close its crimson eye before impending showers, there is scarcely one flower which may not from its loveliness, its perfume, its natural situation, or its classical association, be considered highly poetical.

"As the welcome messenger of spring, the snowdrop claims our first regard, and countless are the lays in which the praises of this little modest flower are sung. The contrast it presents of green and white (ever the most pleasing of contrasts to the human eye), may be one reason why mankind agree in their admiration of its simple beauties; but a far more powerful reason is the delightful association by which it is connected with the idea of returning spring. Perhaps we have thought long of the melting of the snow that impeded our noon-day walk. But it vanishes at last; and there, beneath its white coverlid, lies the delicate snowdrop, so pure and pale, so true an emblem of hope, and trust, and confidence, that it might teach a lesson to the desponding, and show the useless and inactive how invaluable are the stirrings of that energy

that can work out its purpose in secret and under oppression, and be ready in the fullness of time to make that purpose manifest and complete. The snowdrop teaches also another lesson. It marks out the progress of time. We cannot behold it without feeling that another spring has come, and immediately our thoughts recur to the events which have occurred since last its fairy bells were expanded.

"It is of little consequence what flower comes next under consideration. A few specimens will serve the purpose of proving that these lovely productions of Nature are, in their general associations, highly poetical. The primrose is one upon which we dwell with pleasure proportioned to our taste for rural scenery, and the estimate we have previously formed of the advantages of a peaceful and secluded life. In connection with this flower, imagination pictures a thatched cottage standing on the slope of the hill, and a little woody dell, whose green banks are spangled all over with yellow stars, while a troop of rosy children are gamboling on the same bank, gathering the flowers, as we used to gather them ourselves, before the toils and struggles of mortal conflict had worn us down to what we are now, and thus presenting to the mind the combined ideas of natural enjoyment, innocence, and rural peace—the more vivid, because we can remember the time when something like this was mingled with the cup of which we drank—the more touching, because we doubt whether, if such pure drops were still there, they would not to our taste have lost their sweetness.

"The violet, while it pleases by its modest, retiring beauty, possesses the additional charm of the most exquisite of all perfumes, which, inhaled with the pure and invigorating breezes of spring, always brings back in remembrance a lively conception of that delightful season. Thus, in the language of poetry, 'the violet-scented gale' is synonymous with those accumulated and sweetly-blended gratifications which we derive from odors, flowers, and balmy breezes; and, above all, from the contemplation of renovated nature, once more bursting forth into beauty and perfection.

"The jasmine, also, with its dark, green leaves and little silver stars, saluting us with its delicious scent through the open casement, and impregnating the whole atmosphere of the garden with its sweetness, has been sung and celebrated by so many poets, that our associations are with their numbers rather than with any intrinsic quality in the flower itself. Indeed, whatever may have first established the rank of flowers in the poetical world, they have become to us like notes of music passed on from lyre to lyre; and whenever a chord is thrilled with the harmony of song, these lovely images present themselves, neither impaired in their beauty nor exhausted of their sweetness, for having been the medium of poetic feeling ever since the world began.

"It is impossible to expend a moment's thought upon the lily, without recurring to that memorable passage in the sacred volume—'Consider the lilies of the field, how they grow. They toil not, neither do they spin; and yet I say unto you, that Solomon in all his glory was not arrayed like one of these.' From the little common flower called heart's ease, we turn to that well-known passage of Shakspeare, where the fairy king so beautifully describes the "little western flower." And the forget-me-not has a thousand associations tender and touching, but, unfortunately, like many other sweet things, rude hands have almost robbed it of its charm. Who can behold the pale narcissus, standing by the silent brook, its stately form reflected in the glassy mirror, without losing himself in that most fanciful of all poetical conceptions in which the graceful youth is described as gazing upon his own beauty, until he becomes lost in admiration, and finally enamored of himself; while hopeless Echo sighs herself away into a sound, for the love which, having centered in such an object, was neither to be bought by her caresses nor won by her despair?

"Through gardens, fields, forests, and even over rugged mountains, we might wander on in this fanciful quest after remote ideas of pleasurable sensation connected with present beauty and enjoyment; nor would our search be fruitless, so long as the bosom of the earth afforded a receptacle for the germinating seed—so long as the gentle gales of summer continued to waft them from the parent stem, or so long as the welcome sun looked forth upon the ever-blooming garden of Nature.

"One instance more, and we have done. The 'lady rose,' as poets have designated this queen of beauty, claims the latest though not the least consideration in speaking of the poetry of flowers. In the poetic world, the first honors have been awarded to the rose, for what reason it is not easy to define, unless from its exquisite combination of perfume, form, and color, which has entitled this sovereign of flowers in one country to be mated with the nightingale; in another, to be chosen, with the distinction of red and white, as the badge of two honorable and royal houses. It would be difficult to trace the supremacy of the rose to its origin; but mankind have so generally agreed in paying homage to her charms, that our associations in the present day are chiefly with the poetic strains in which they are celebrated. After all the pains that have been taken to procure, transplant and propagate the rose, there is one kind perpetually blooming around us through the summer months, without the aid or interference of man, which seems to defy his art to introduce a rival to its own unparalleled beauty—the common wild rose. Blooming in the sterile waste, this lovely flower is seen unfolding its fair leaves where there is no beauty to reflect its own, and thus calling back the heart of the weary traveler to thoughts of peace and joy—reminding him that the wilderness of human life, though rugged and barren to the discontented beholder, has also its sweet flowers, not the less welcome for being unlooked for, nor the less lovely for being cherished by a hand unseen."

To these elegantly expressed sentiments, nothing need be added by the writer of these pages.

Laying out of Flower-Gardens.—Flowers are cultivated in the borders and parterres of gardens of a mixed kind, along with kitchen vegetables and fruits; and this may be said to be the general plan in those grounds of limited space belonging to persons of moderate means, and limited in the extent of their possessions. Many, however, cultivate flowers in gardens exclusively appropriated to them, and also in the isolated clumps which decorate ornamental lawns. In whichever way, the method of culture is clearly the same; and therefore it is unnecessary for us to enter into particulars with reference to all the sizes and kinds of gardens in which flowers may be grown.

The directions given in the previous sheet on the laying out, shelter, and exposure of kitchen gardens, apply also to flower-gardens. The soil should be rich, dry, soft, and partially improved with decomposed peat and leaf mould; the exposure should be toward the sun; a free air should be allowed to play over the ground; and means should be at hand for procuring a plentiful supply of pure, soft water for irrigation. Every flower-garden, also, should possess a small store of fine washed sand as a restorative, and for scattering beneath the finer kinds of flowers when in bloom, as a protection from creeping vermin. Besides the utensils usually employed, the flower-gardener should have a pair of small scissors to clip off decayed leaves, and some strips of mat for tying up certain drooping plants.

The greatest difference of taste prevails on the subject of disposing the various parts of a flower-plot or garden. Straight-lined borders, ovals, circles, and fancy figures have each their admirers; and we should advise every one to adopt that form which will be most effective in striking the eye. If the garden is seen from a parlor window, as is often the case, the plan most agreeable is to lay out the foreground as a patch of well-shaven green, which is fresh both winter and summer; on its farther side there may be a semicircular border; then a walk; and next parterres of such form and size as will suit the extent of the ground. If the garden contain kitchen vegetables, they should be out of sight of the windows of the dwelling-house, or at least not brought ostentatiously forward. "It is more difficult," says the author of the *Florist's Manual*, "than may at first appear, to plan, even upon a small scale, such a piece of ground; nor, perhaps, would any but an experienced, scientific eye be aware of the difficulties to be encountered in the disposal of a few shaped borders interspersed with turf. The nicety consists in arranging the different parts so as to form a connected glow of color; to effect which, it will be necessary to place the borders in such a manner that, when viewed from the windows of the house, or from the principal entrance into the garden, one border shall not intercept the beauties of another—nor, in avoiding that error, produce one still greater, that of vacancies betwixt the borders, forming small avenues, by which the whole is separated into broken parts, and the general effect lost. Another point to be attended to is the just proportion of green turf, which, without nice observation, will be too much or too little for the color with which it is blended; and lastly, the breadth of the flower-borders should not be greater than what will place the roots within the reach of the gardener's arm without the necessity of treading upon the soil, the mark of footsteps being a deformity wherever it appears among flowers."

Whether all the flowers of a class—such, for instance, as violets, hyacinths, &c.—should be cultivated together, or interspersed and mingled with others, is another matter for taste to decide. The preferable plan seems to be to form a choice variety in borders and in other spots, but also to cultivate a quantity of certain sorts in compartments by themselves. Neill judiciously observes, on the choice of flowers for borders—"The plants are arranged in mingled flower-borders, partly according to their size and partly according to their color. The tallest are planted in the back part, those of middling size occupy the centre, and those of humble growth are placed in front. The beauty of a flower-border, when in bloom, depends very much on the tasteful disposition of the plants in regard to color. By intermingling plants which grow in succession, the beauty of the border may be prolonged for some weeks. In a botanic garden, the same plant cannot be repeated in the same border; but in the common flower-garden, a plant, if deemed ornamental, may be often repeated with the best effect; nothing can be finer, for example, than to see many plants of double scarlet lychnis, double sweet-william, or double purple jacobæa."

The Dutch, who are among the best flower-gardeners in the world, have lately begun to copy the English in ornamenting turf lawns with plots of various kinds of flowers; but in all their large and regular gardens, they still dispose each kind of flowers by themselves. "We ridicule this plan," says Hogg in his Treatise on Flowers, "because it exhibits too great a sameness and formality; like a nosegay that is composed of one sort of flowers only, however sweet and beautiful they may be, they lose the power to please, because they want variety. It must undoubtedly be acknowledged, that a parterre, no matter in what form—whether circular or square, elliptical or oblong—where all the shrubs, plants and flowers in it, like the flowers in a tastefully arranged bouquet, are variously disposed in neat and regulated order, is a delightful spectacle, and worthy of general imitation. Yet still, in some particular cases, I am disposed to copy the Dutchman; and I would have my bed of hyacinths distinct, my anemones, my ranunculuses, my pinks, my carnations distinct, and even my beds of hollyhocks, double blue violets, and dwarf lark-spurs distinct, to say nothing of different sorts of roses. Independently of the less trouble you have in cultivating them when kept separate, you have beauty in masses, and you have likewise their fragrance and perfume so concentrated, that they are not lost in air, but powerfully inhaled when you approach them." Leaving this question to be settled according to taste and other circumstances, we have only to recommend that no flower or herb of any kind should be sown or planted in figures resembling familiar objects. Some persons, for example, will be seen sowing annuals or planting crocuses in the figure of a letter of the alphabet, a spoon, a ship, a house, &c.—a practice so essentially vulgar that it cannot be too loudly condemned.

An error not uncommon in deciding which flowers shall be planted, is to select numbers merely for their rarity or novelty, without reference to what will be their appearance when in bloom, and which generally leads to disappointment. Unless for botanical illustration, make a choice of flowers on two principles—those which will be beautiful when in bloom, although common, and those which will bloom at the particular seasons required, to ensure a succession of variegated beauty from spring to autumn. The true amateur gardener takes a pride in improving even the commonest flowers—urging them by careful culture to the highest state of perfection as to size and brilliancy of coloring of which they are susceptible in our climate.

Balsam of Turpentine.—Melt by a gentle heat black rosin 1 lb.; remove the vessel from the fire and add oil of turpentine 1 pint.

[Cooley's Cyclopædia of Practical Receipts.]

EXHAUSTION OF LAND BY GROWING WHEAT.—To confine ourselves to Wheat—it appears from the recent researches of Dr. H. Will that 100 parts of the earthy constituents of the grain consist of—

Potass	22 to 34	parts.
Soda	16	parts.
Lime	2 to 3	parts.
Magnesia	9 to 13	parts.
Peroxide of iron	1	parts.
Phosphoric acid	49	parts.

A trace of sulphuric acid, silica, and fluorine.

whilst the earthy constituents of Wheat straw contain very little phosphoric acid, but a large amount of silica. Now, it is obvious that if the farmer continually restores all the straw to his land, but neglects, from want of knowledge, or means, to replace the earthy matter of the grain, the land will be exhausted, and he cannot continue to grow Wheat upon it.* Moreover, if he make an effort to maintain the fertility of the land for Wheat, he must restore to it every ingredient of which it becomes exhausted by his crop in a proper proportion. To know this proportion essential to the growth of every particular crop, he must have recourse to information supplied by Chemistry. One of the earthy constituents of Wheat enters so largely into many other crops, that the amount taken off the land everywhere is very great, and constitutes a considerable proportion of the total amount contained in ordinary land, so that the loss has already, even in the present state of science, excited attention, and aroused the efforts of the farmer to repair it. We allude to phosphoric acid. Now, the chemist has shown, that in the bones of animals a great part of this material which has been drawn from land in the growth of vegetables is to be found, stored up in a form suitable for its restoration.

[Proposal for establishing a College of Chemistry.

* This accounts for the exhaustion of the wheat lands, in Western New-York, from twenty bushels of Wheat to the acre, twenty years ago, down to eleven bushels now. This accounts too, in part, for the check to the population of that region in the last few years. There will be general exhaustion and drain from all the other States, as long as land can be had in the West for $1 25 and *for nothing* after a few years when emigrants and their descendants get a little stronger. [*Ed. Farm. Lib.*

PRICES CURRENT.

[*Corrected, January 21, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort	₱ 100 ℔.	3 75 @ 3	81½
Pearls, 1st sort, '45		4 12½ @ —	—
BEESWAX—American Yellow		— 29 @ —	29½
CANDLES—Mould, Tallow	₱ ℔	— 9 @ —	11
Sperm, Eastern and City		— 26 @ —	38
COTTON—From	₱ ℔.	— 6½ @ —	9½
COTTON BAGGING—American		— 12 @ —	13
CORDAGE—American	₱ ℔.	— 11 @ —	12
DOMESTIC GOODS—Shirtings,	₱ y.	— 5½ @ —	11
Sheetings		— 7½ @ —	15
FEATHERS—American, live		— 28 @ —	31
FLAX—American		— 7 @ —	7½
FLOUR & MEAL—Genesee,	₱ bbl.	5 62½ @ 5	75
Troy		— — @ —	—
Michigan		5 62½ @ 5	62½
Ohio, flat hoop		5 62½ @ 5	66¾
Ohio, Heywood & Venice		6 50 @ 6	75
Ohio, via New-Orleans		5 50 @ —	—
Pennsylvania		— — @ —	—
Brandywine		— — @ 5	87½
Georgetown		5 62½ @ 5	75
Baltimore City Mills		5 62½ @ 5	75
Richmond City Mills		6 62½ @ —	—
Richmond Country		5 62½ @ 5	75
Alexandria, Petersburg, &c		5 62½ @ 5	75
Rye Flour		4 25 @ —	—
Corn Meal, Jersey and Brand		3 75 @ 4	—
Corn Meal, Brandywine	hhd.	17 50 @ —	—
GRAIN—Wheat, Western	₱ bush.	1 20 @ 1	30
Wheat, Southern	new	1 20 @ 1	30
Rye, Northern		— 79 @ —	80
Corn, Jersey and North	(meas.)	— 68 @ —	—
Corn, Southern	(measure)	— 70 @ —	—
Corn, Southern	(weight)	— 67½ @ —	68
Oats, Northern		— 48 @ —	50
Oats, Southern		— 38 @ —	40
HAY—North River	bales	— 90 @ —	97½
HEMP—American, dew-rotted	ton	87 50 @ 105	—
" " water-rotted		125 — @ 175	—
HOPS—1st sort, 1845		— 20 @ —	25
IRON—American Pig, No 1		35 — @ 37	—
" Common		25 — @ 30	—
LIME—Thomaston	₱ bbl.	— 97½ @ 1	—
LUMBER—Boards, N.R.,	₱ M. ft. clr.	35 — @ 40	—
Boards, Eastern Pine		11 — @ 13	—
Boards, Albany Pine	₱ pce.	— 10 @ —	19
Plank, Georgia Pine	₱ M. ft.	— — @ 35	—

Staves, White Oak, pipe	₱ M.	48 — @ 50	—
Staves, White Oak, hhd		38 — @ 40	—
Staves, White Oak, bbl		28 — @ 30	—
Staves, Red Oak, hhd		30 — @ 31	—
Hoops		25 — @ 30	—
Scantling, Pine, Eastern		— — @ 16	25
Scantling, Oak		30 — @ 35	—
Timber, Oak	₱ cubic foot	— 25 @ —	37
Timber, White Pine		— 18 @ —	25
Timber, Georgia Yellow Pine		— 30 @ —	35
Shingles, 18 in	₱ bunch	1 75 @ 2	—
Shingles, Cedar, 3 feet, 1st quality		— — @ 24	—
Shingles, Cedar, 3 feet, 2d quality		22 — @ 23	—
Shingles, Cedar, 2 feet, 1st quality		19 — @ —	—
Shingles, Cedar, 2 feet, 2d quality		16 — @ 18	—
Shingles, Cypress, 2 feet		13 — @ 14	—
Shingles, Company		— — @ 29	—
MUSTARD—American		— 17 @ —	25
NAILS—Wrought, 6d to 20d	₱ ℔.	— 10 @ —	12½
Cut, 4d to 40d		— 4 @ —	4½
PLASTER PARIS—₱ ton		2 62½ @ —	—
PROVISIONS—Beef, Mess,	₱ bbl.	8 — @ 8	50
Beef, Prime		5 — @ 5	50
Pork, Mess, Ohio		13 — @ 13	50
Pork, Prime, Ohio		10 12½ @ 10	50
Lard, Ohio	₱ ℔.	— 7½ @ —	8½
Hams, Pickled		— 7 @ —	7½
Shoulders, Pickled		— 5 @ —	5½
Sides, Pickled		— 6 @ —	6½
Beef, Smoked	₱ ℔.	— 6½ @ —	7
Butter, Orange County		— 18 @ —	20
Butter, Western Dairy		— 14 @ —	17
Butter, ordinary		— 11 @ —	13
Cheese, in casks and boxes		— 7 @ —	7½
SEEDS—Clover	₱ ℔.	— 10 @ —	11
Timothy	₱ tierce	16 — @ 17	—
Flax, Rough		10 25 @ 10	37½
SOAP—N. York, Brown	₱ ℔.	— 4 @ —	6
TALLOW—American, Rendered		— 7½ @ —	7¾
TOBACCO—Virginia	@ ℔.	— 3 @ —	6
North Carolina		— 3 @ —	5
Kentucky and Missouri		— 3 @ —	7
WOOL—Am. Saxony, Fleece,	₱ ℔.	— 38 @ —	40
American Full Blood Merino		— 36 @ —	38
American ½ and ¾ Merino		— 30 @ —	33
American Native and ¼ Merino		— 26 @ —	28
Superfine, Pulled		— 28 @ —	30

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SMITHSONIAN FUND:

SUGGESTIONS AS TO ITS APPLICATION: BY J. W. HARDY, OF VA.

WITH respect to this Fund, so generously bestowed on our country, by a foreigner, and which still remains in a state of sequestration, we have always held the opinion, so ably and irresistibly enforced in the following essay, that it should be so disposed of as to diffuse a knowledge of the science and illustrate the best practice of *Agriculture and Horticulture*; in the proportion that these branches of industry contribute to the sustenance, growth and well-being of the country. At all events, in the name of common decency and gratitude, let *something be done with it*—or let it be restored to the heirs of the Testator, who are fast acquiring a right to recover it, in any court of equity. The difficulty, as we have always foreseen, will be in the various conceits of Members of Congress, each one of the few who can be roused to an interest in the subject, imagining that his own is the only wise plan of investing and using the money. There are, too, even among those who ardently desire its benefits for the legitimate objects of the bequest, some who would yet make difficulty even about the *name* of the Establishment to be created: like the dog who, in crossing the stream, let go his meat for the sake of an empty shadow. So far from higgling about a matter so really unsubstantial, when compared with a judicious application of the Fund, we would not, for its sake, lose a day's interest of the money. But if difficulties so visionary must be entertained, surely there could be nothing very far wrong or graceless in giving it the name of SMITHSON. If he made no intimation of such a condition, it does not follow that he did not regard it as a somewhat material occurrence. At all events there would seem to be, on that account, not the less propriety, not to say obligation, to associate, with a magnificent public benefaction, the *name of the generous foreigner who bestowed it*. If other Institutions or interests would reject the name, and with it the boon, we will answer for it that *Agriculture* will not be so fastidious. Her votaries will gladly and gratefully inscribe his name on any temple dedicated by his munificence to her benefit and glory.

FRANCIS MARKOE, JR. Esq.

Cor. Secretary of the National Institute:

DEAR SIR: The representatives of the people are again assembled in Congress, and a bill has been introduced to dispose of the large Fund bequeathed to the United States by Mr. Smithson. I assume, as granted, that the faith and honor of the Nation, as to this Fund, will be preserved inviolate: and it would be gratifying to me if the credit of establishing an Institution, honorable to the Nation, and suitable to the liberal designs of Mr. Smithson, should belong to the present Congress. An occasion more fit than the present will hardly present itself for publishing, through you, some views respecting this interesting subject. With becoming deference I proceed at once to my object.

The expressive language of Smithson, as to the design he wished to accomplish with the Fund, is doubtless remembered: "The increase and diffusion of Knowledge among men." I agree with the late memorable Du Ponceau, that, in considering attentively the words of Mr. Smithson, we must be convinced that "his views were more extensive than the foundation of an establishment for the promotion of particular objects of Science, and that he contemplated an Institution that would embrace the whole

circle of human knowledge." In this circle, however, there are many departments—some of relatively little value, others of essential importance, vitally connected with the industrial pursuits and well-being of man. It is my purpose to bring forward, as I may be able, the claims of Agriculture to a prominent place in the Institution about to be established.

In attempting to show these claims, we must not be supposed to underrate the great interests of Commerce, Mining, Manufactures, and similar pursuits. These interests and those of Agriculture are closely related. They are mutually beneficial—they flourish and decline together. Especially, if Agriculture, the leading interest among us, shall be promoted, all other departments of human labor will feel the beneficial impulse.

The United States are now, and must continue for a long period, essentially an agricultural nation. This is proved by the last Census. The "Compendium of the Sixth Census," as prepared by the Department of State, shows that in 1840 there were engaged in Agriculture 3,719,951 persons, while at the same time there were in all other kinds of business only 1,079,548 persons. For *every* person, therefore, engaged in other kinds of business, we find more than *three* employed in Agriculture—the ratio between the foregoing numbers being 1 to 3.44+. When we consider this ratio, together with the sparseness of our population, and our large and increasing territory, we must be regarded as an agricultural people, and destined so to continue. The habits and the interests of the people incline them, as a body, to the country, where may be found the true freedom and independence of America. The inestimable value of our social and civil institutions is seen nowhere, we think, to as great advantage as in the farm-house, or the country mansion of the planter. So long as the spirit of those institutions exists among us, we shall continue an agricultural people.

To show the preëminent claims of Agriculture to our attention, we will refer to some statistics relating to particular sections of the country. We shall assume Massachusetts, Virginia, Mississippi, and Indiana, as fit representative States of different sections of the Union, and briefly notice this agricultural condition.

In 1840, Massachusetts contained 87,837 persons employed in Agriculture, 85,166 in Manufactures and Trades, 35,219 in Commerce and Navigation, and 4,675 in other pursuits. It would seem, therefore, that, judging from the number of persons employed, we should regard the interests of Agriculture preëminent even in the Old Bay State, where other interests are cherished and protected with much care. The following table shows the ratio of the number of persons employed in Agriculture to the number employed in all other pursuits, in Virginia, Mississippi and Indiana:

	Agriculture.	Other pursuits.	Ratio.
Virginia	318,771	69,903	4.56+
Mississippi	139,724	7,077	19.74+
Indiana	148,806	26,852	5.54+

The agricultural population is, therefore, more than *four and a half* times as large as the population depending on other kinds of labor in Virginia; more than *nineteen and a half* times in Mississippi; and in Indiana more than *five and a half* times as large. If, as political economists may contend, the profits of Agriculture and other forms of human labor are equal, the value of agricultural profits for 1 year is equal to the profits of all other pursuits for 4½ years in Virginia, nearly 20 years in Mississippi. and 5½ years in Indiana. Are not the claims of Agriculture to the protection and favor of Government proportionately strong? If, as we have shown, *three-fourths* of the whole population of the country, and if *nineteen-twentieths* of some States are employed in Agriculture, it should seem but just that its invaluable interests receive proportionate care.

If we were to consider the counties of the different States, or even of a single State, equally decisive results would be obtained. We shall refer only to the county of Mecklenberg, from which we write. The number of persons employed in Agriculture in this county is 6,572; while those otherwise employed number only 789—giving the ratio of 1 to 8.3+. So that more than *eight-ninths* of the population of this large and respectable county subsist by cultivating the soil; and of the 789 who are said to be otherwise employed, I know but very few who do not receive the means of subsistence, more or less, from the same source. This is, no doubt, true also of nearly every county in the State, and perhaps in the Union.

Not wishing to be tedious, I will conclude this part of the subject with a brief reference to the annual products of some of our most valuable crops. A table of much interest respecting Agriculture may be found at page 375 of the "Compendium of the Sixth Census," already mentioned; which may also be found in "Tucker's Progress of the United States," and at page 274 of that most excellent publication, the "Monthly Journal of Agriculture," by Mr. Skinner, of New-York. From that table we take the following results:—The United States produce annually 84,823,272 bushels of Wheat, 123,071,341 bushels of Oats, 377,531,875 bushels of Indian Corn, 108,278,060 bushels of Potatoes, 219,163,319 pounds of Tobacco, 790,479,275 pounds of Cotton, and 155,110,809 pounds of Sugar If we estimate these crops according to their present prices in the city of Richmond, Va. we shall find them to be worth from four

hundred and fifty to five hundred million dollars. Hence the annual productive value of the seven crops above mentioned is nearly equal to half the value of the entire agricultural and dairy produce of the British Empire, which has been recently estimated at eleven hundred million dollars. If we were to increase the amount given above by the annual produce of the live stock and all the remaining crops of the country, we should form a probable estimate of its agricultural wealth.

May we not, then, be safely considered, in the aggregate, a nation of planters? And is not the cultivation of the soil the basis of our national wealth? The dignity of the plow should be asserted, and every friend of American greatness and independence should strive to give efficiency and success to whatever will elevate and strengthen the agricultural interests of the nation.

We shall next consider how the interests of Agriculture may be subserved in the establishment of the proposed Smithsonian Institution. If what we have written above be attentively regarded, it will be duly conceded, we think, that an Agricultural Department of wide extent should be preëminent among its objects.

How should such a Department be organized? We propose to answer this question at some length.

We place among the *first* requisites of this Department a well-appointed Chemical Hall, or Laboratory.

Agriculture is a chemical Art. The atmosphere which surrounds the growing plant—the water that refreshes and gives it vigor—the soil into which its roots penetrate—the manures that supply it with food—and the plant itself—its roots, stalk, leaves, sap, flowers, and seed—are chemical compounds; many of them complicated in their nature, and having extensive and abstruse relations. If we take the most simple in this composition, atmospheric air and water, we find them composed of oxygen, nitrogen, hydrogen, carbonic acid, and ammonia, with one or two other bodies which may, perhaps, be considered incidental. These are substances strictly chemical in their nature, and having a range of affinity more extensive than any known in the science. Their affinities embrace each other, and nearly all other elementary and compound bodies. Oxygen, for instance, combines with nitrogen in at least five proportions, besides entering into the composition of the atmosphere; also with hydrogen in two proportions—one of which is water, a chemical agent of great extent and influence; and with carbon, forming two compounds—one of them carbonic acid, sustaining a peculiar and important relation in the nourishment and growth of plants. Combinations are likewise formed with metallic and non-metallic elements by oxygen; it enters into nearly all compounds of animal and vegetable origin, and has a prominent place among the constituents of the soil and manures, indeed, of all the forms and modifications of matter.

Air and water, it is thought, contain a large portion of the food essential to the nutrition of plants. Dr. Liebig, in his "Organic Chemistry of Agriculture and Physiology," has said—"Carbonic acid, ammonia and water yield elements for all the organs of plants. The atmosphere and the soil offer the same kind of nourishment to the leaves and roots. The former contains a comparatively inexhaustible supply of carbonic acid and ammonia; the latter, by means of its *humus*, generates constantly fresh carbonic acid, while, during the winter, rain and snow introduce into the soil a quantity of ammonia sufficient for the development of the leaves and blossoms." Excepting, then, the inorganic elements, which are supposed by him to be of secondary importance, it is the opinion of Liebig that the constituents we have been considering supply in the form of carbonic acid, ammonia and water, the only food of plants. Though this view has been questioned, and, I conceive, justly, by Johnston, it yet remains true by the admission of all chemists, that these three compounds act a very important and essential part in the economy of vegetable life.

Whatever transformations these agents excite or undergo, they seem to be as purely chemical in their nature as the agents themselves. The carbon of the carbonic acid is taken by the plant, and its oxygen is evolved. So the elements of ammonia and water may be used at the pleasure of the plant. Here nothing is observed which may not be seen in all other cases of chemical action. The old body is destroyed, and a new one is formed. The elements forsake their old combinations and enter into new relations. So when a vessel of chlorine is inverted over a warm solution of sal-ammoniac, the explosive chloride of nitrogen is the result, the chlorine and the nitrogen entering into a new relation. Here is a fact which we can explain only by saying that in the peculiar circumstances mentioned the chlorine and the nitrogen are brought together by chemical affinity, while the sal-ammoniac is decomposed. When the carbonic acid comes into contact with the leaves of plants, similar facts are observed: the carbon unites with oxygen and hydrogen to form woody fibre, and the carbonic acid is, of course, destroyed. Why should we say that the transformations are due in the former case, to chemical affinity, and in the latter to some other agency? What is here said of carbonic acid may also be said of water and ammonia.

But whether we attribute these transforma-

tions to chemical affinity, the vital principle, electricity, or any other force, Agriculture is none the less a chemical art. If we wish to know in what circumstances a plant will best thrive, it is necessary that we should ascertain its appropriate food; and, in order to this, what method is likely to be so accurate and effectual as the chemical analysis of the plant itself, and the sources whence its food is drawn? Every plant is composed of the elements of matter which must have been drawn from the atmosphere, from water, or the soil. Transformations have certainly taken place: what was before in the soil or the atmosphere is now a part of the plant, and nothing is found in the latter that has not been received from the former. If we look into the plant, we see what is essential to its nutrition; if we examine the soil, the water, and the air, we ascertain whether these contain its appropriate food: if they do, the plant should thrive without manures; if not, it is necessary to know the composition and action of manures, before its appropriate food can be *intelligently* supplied. Hence we arrive at the conclusion that before we can determine with scientific precision what is necessary in a given place, in order that any plant may be grown successfully, we must know—

1st. The composition of the plant;

2d. The composition of the air and water;

3d. The composition of the soil;

4th. The composition of manures.

The composition of the atmosphere and water in their normal state may be considered constant. Hence, when their constituents have been once correctly ascertained, farther analysis may be dispensed with; but as to plants and soils and manures, their composition varies with time and place. Here it is, especially, that Agriculture requires the aid of Chemistry. Not only must the composition and chemical relations of the atmospheric elements, oxygen, nitrogen, carbonic acid, ammonia and water, be determined—not only must the composition of all plants and of every part of each plant be accurately analyzed—but the varying and complicated nature of soils and manures demand the highest powers of chemical analysis. Human genius may here find an ample field for its exercise. The territory is large and comparatively unexplored. Davy, Liebig, Boussingault and Johnston have surveyed it—have carried through it the compass and the chain; marked its grand divisions and described its general features. A century of human effort will hardly complete what they have begun—will fail to open and cultivate the ground which they have as yet but just surveyed.

To illustrate the views we have attempted to offer, as to the relation of Chemistry to Agriculture, we will briefly consider one or two of our most valuable crops. The following table gives the *general* composition of wheat and oats, according to Boussingault:

TABLE I....Composition of Wheat and Oats.

Composition.	Wheat.	Oats.
Carbon	45·50	50·70
Oxygen	43·10	36·70
Hydrogen	5·70	6·40
Nitrogen	3·40	2·20
Ash	2·30	4·00
Total	100·00	100·00

Confining our attention at present to the four elements, oxygen, carbon, hydrogen and nitrogen, it may be observed that they compose essentially the whole plant, except the ash, which is the product left after combustion. Combining with each other in different proportions, they form all those nutritive compounds, such as gluten, starch, albumen, sugar and the like, which give value to the crops. Hermbstadt sowed ten patches with the same seed of each crop, and applied a different manure to each patch. The seed produced in each instance were analyzed, and the following tables give the results:

TABLE II....Showing the Composition of Wheat and the Effects of Manures.

Composition.	Ox blood.	Nightsoil.	Sheep's dung.	Goat's dung.	Human urine.	Horse dung.	Pigeon dung.	Cow dung.	Vegetable manure.	Unmanured.	Average.
Return	14 fold	14 fold	12 fold	12 fold	12 fold	10 fold	9 fold	7 fold	5 fold	3 fold	9·8 fold
Water	4·3	4·2	4·2	4·3	4·2	4·3	4·3	4·2	4·2	4·2	4·24
Gluten	34·2	33·9	32·9	32·9	35·1	13·7	12·2	12·0	9·6	9·2	22·57
Albumen	1·0	1·3	1·3	1·3	1·4	1·1	0·9	1·0	0·8	0·7	1·08
Starch	41·3	41·4	42·8	42·4	39·9	61·6	63·2	62·3	65·9	66·6	52·74
Sugar	1·9	1·6	1·5	1·5	1·4	1·6	1·9	1·9	1·9	1·9	1·71
Gum	1·8	1·6	1·5	1·5	1·6	1·6	1·9	1·9	1·6	1·8	1·68
Fatty oil	0·9	1·1	1·0	0·9	1·0	1·0	0·9	1·0	1·0	1·0	0·98
Soluble phosphates, &c	0·5	0·6	0·7	0·7	0·9	0·6	0·5	0·5	0·5	0·3	0.58
Husk and bran	13·9	14·0	13·8	14·2	14·2	14·0	14·0	14·9	14·0	14·0	14·01
Total	99·8	99·7	99·7	99·7	99·7	99·5	99·8	99·7	99·5	99·7	99·68

TABLE III....SHOWING THE COMPOSITION OF OATS AND THE EFFECTS OF MANURES.

COMPOSITION.	Ox blood.	Nightsoil.	Sheep's dung.	Goat's dung.	Human urine.	Horse dung.	Pigeon dung.	Cow dung.	Vegetable manure.	Unmanured.	Average.
Water	12·0	12·1	12·6	12·9	13·0	13·1	12·3	11·6	10·8	10·8	12·12
Gluten	5·0	4·6	4·0	4·3	4·4	4·0	3·2	3·1	2·0	1·9	3·65
Albumen	0·4	0·4	0·5	0·4	0·5	0·5	0·3	0·3	0·2	0·2	0·37
Starch	53·1	53·3	59·0	53·2	53·1	54·5	53·2	55·0	59·9	60.0	54·93
Sugar	3·8	3·8	5·2	5·4	5·0	5·2	5·0	6·8	6·4	6·4	5·22
Gum	5·5	5·4	5·5	5·7	5·7	5·6	6·8	7 3	7·0	7·0	6·15
Oil	0·3	0·3	0·3	0·3	0·4	0·3	0·3	0·3	0·2	0·3	0·30
Soluble phosphates, &c	0·4	0·5	0·4	0·4	0·6	0·5	0·3	0·3	0·2	0.1	0·37
Husk and bran	19·3	19·2	13·3	17·0	17·0	16·0	18·3	15·0	13·0	12·0	16·01
Total	99·8	99·6	95·8	98·6	99·7	99·7	99·7	99·7	99·7	98·7	99·12

These analyses of Hermbstadt may be more or less incorrect, but coming from a chemist of acknowledged skill, they may be considered sufficiently correct for our present purpose. We wish to accompany these tables with some explanatory remarks:

1st. If we except the soluble phosphates, all the other substances in the tables are composed of oxygen, carbon, hydrogen and nitrogen, the first four elements, mentioned in Table I.

2d. The soil in which the wheat and oats were sown had the same composition.

3d. The seed sown were of the same kind.

4th. They were alike subject to the same atmospheric air, the same water and the same climate.

5th. The composition of the ten specimens of wheat in Table II. and of the ten specimens of oats in Table III. varies in a remarkable degree. The amount of gluten in some specimens of wheat is more than three times as large as in others, and the starch of some exceeds that of others by more than one-half. It may be observed, also, that as the starch increases, the gluten diminishes.

6th. The only agency calculated to produce these discordant results is that of the different manures. How these manures act, it is difficult, perhaps in the present state of chemical science impossible, to explain. We cannot ascribe their effects, with certainty, to any peculiar principle contained in the manures; in other words, we cannot assign in each case an adequate cause for the special result. But the effect is sure, and the cause must exist. It can be found only in the peculiar composition and agency of the manures applied to the wheat and oats; and rigid chemical analysis alone must assign with precision the efficient cause in each instance.

7th. By the aid of chemistry we are informed in these tables that a relation before unknown exists between the grain of wheat and oats and the manures applied to the soil. The chemical constitution of the grain, and, therefore, the quality of the flour, depend on the nature of the manure. If this principle be susceptible of general application, it opens to the chemist and the scientific agriculturist a field of great interest and future profit.

I will now briefly consider the ash left after burning the straw of wheat and oats. Sprengel gives the following table:*

TABLE IV...SHOWING THE COMPOSITION OF THE ASH FROM WHEAT AND OAT STRAW.

COMPOSITION.	Wheat straw.	Oat straw.	Ratio.	
Potash	0·6	15·2	25·3	$\frac{15·2}{0·6}=25·3+$
Soda	0·8	trace.		
Lime	6·8	2·6		
Magnesia	0·9	0·4		
Silica	81·6	80·0		
Alumina		0·1		
Oxide of iron	2·6	trace.		
Oxide of manganese		trace.		
Phosph. acid.	4·8	0·2	24·0	$\frac{4·8}{0·2}=24·0$
Sulph'ric acid	1·0	1·4		
Chlorine	0·9	0·1		
Total	100·0	100.0		

These results show that the ashes of wheat and oat straw differ remarkably respecting potassa and phosphoric acid—there being in oat straw more than twenty-five times the quantity of potassa in wheat straw, and twenty-four times as much phosphoric acid in wheat straw as in oat straw—so that these bodies would seem to vary in an inverse ratio with each other. It may be inferred, therefore, that oats will thrive well in a soil exhausted by Wheat.

In Table IV. the constituents of the straw are given without any reference to the manner in which they are combined with each other. The acids and alkalies, or oxides, may form salts, and according to M. Berthier, the following table exhibits the relative proportions of these salts in wheat straw;

* For Tables II. III. and IV. I am indebted to that excellent work, "Johnston's Agricultural Chemistry."

TABLE V....By M. Berthier.*

	Ash of Wheat Straw.
Sulphate of potash	00·4
Chloride of potassium	03·2
Silica	71·5
Carbonate of lime	09·6
Sulphate of lime	trace
Magnesia	trace
Oxide of iron	trace
Oxide of manganese	trace
Silicate of potash	13 0
Phosphate of lime	02·3
Total	100·0

Although the practiced eye of the chemist will readily perceive some disagreement between this Table and the first column of Table 4, he must acknowledge that these salts are purely chemical, and occupy a prominent place among chemical reâgents.

From the preceding discussion, (which might be much extended,) we think it must be clear that the relation of Chemistry to Agriculture is intimate and interesting. All the material agents employed in the nutrition and growth of plants have the composition and affinities of chemical bodies. The soil is a mixture of chemical compounds, and so are atmospheric air, water, manure, the seed sown, the plant produced, and the seed gathered. We begin and end the process of cultivation with the compounds and agents well known in Chemistry. These conclusions are true, whatever modifying or controlling influence other mysterious agents, such as the vital power, may exercise over the usual chemical affinities and relations of the bodies employed. In a word, Agriculture is a chemical art.

In any department of Agriculture, therefore, the Chemical Laboratory is needed. It should be amply provided with apparatus and chemical agents for experiment, for illustration, and for analysis.

As Mineralogy and Geology are both intimately related to Chemistry and Agriculture, the Laboratory should be furnished with a cabinet of minerals and a collection of geological specimens.

But Geology is as closely related to Botany, Zoology, Comparative Anatomy, Ornithology, and, indeed, to all the useful and interesting branches of Science connected with the animal and vegetable kingdoms, as that is to Mineralogy, Chemistry, and Agriculture. In connection with the Chemical Hall, ample collections might be made in all the departments of Natural Science.

I have thus briefly considered what might be appropriately attached to the Chemical Hall.—Whatever is undertaken should be devised on a liberal scale. It should be worthy of the princely gift of Smithson—worthy of the great people he honored with his gift—worthy of the Republican character and agricultural interests of a wise and rapidly increasing nation.

In the *second* place, the Agricultural Department should have a sufficient number of well-endowed Professorships, to give instruction in the branches of Science already mentioned.—There should be—

1st. A Professorship of Chemistry, designed to teach the elementary principles of that Science, the art of chemical manipulation, and the best methods of chemical analysis.

2d. A Professorship of Agricultural Chemistry, to be filled only by a thorough chemist and a skillful, scientific farmer. He should teach the principles of Agricultural Chemistry—give instruction in the analysis of soils, manures, seed-plants, and the like—and superintend an experimental farm, which should be connected with his department. In the Professorship, provision might be made, to a certain extent, for analyzing the soils of the farmers and planters of the country, as they might desire.

3d. A Professorship of Mineralogy and Geology, in which these sciences should be taught, both in theory and practice. Minute geological and mineralogical surveys of the adjacent country should be required of this Professorship.

4th. A Professorship of Botany and Vegetable Physiology, organized on the same plan as the preceding Professorship.

5th. A Professorship of Animated Nature, embracing Zoology, Ornithology, Ichthyology, Comparative Anatomy, and their cognate branches of Natural Science. In any of these departments, Assistant Professorships may be added, if they should be found necessary.

I cannot enter into the details which ought to be observed in the organization of these departments; the duties of each should be clearly prescribed and rigidly exacted. The instruction given should be eminently practical, carrying the mind of the learner to the actual observation of Nature, and making him familiar with theoretical and practical Agriculture, and with those sciences to which Agriculture is closely related.

In the *third* place, attention should be given to the formation of manures and the improvement of agricultural implements, and, perhaps, I might add, of domestic animals.

Respecting manures, two things should be specially observed:—1st. Means for testing new methods of forming them and increasing their quantity should be provided on the experimental farm. 2d. Provision should be made for discovering and making known the best methods of preserving all kinds of manures, and especially those necessarily formed on every

* This table is from Boussingault's "Rural Economy," a work both practical and scientific, and worthy of a better English dress than the one given it by "George Law, Agriculturist."

farm, of which the largest and most valuable portion is usually lost in this country.

The implements of Agriculture are as needful to the farmer as the tools of the mechanic are to his trade; and inferior instruments embarrass and hinder the one no less than the other. The enlightened agriculturist is satisfied with nothing short of perfection in the implements and machines used on his farm. Where should he look for aid in perfecting his plow, his scythe, and his machines of all kinds, more appropriately than to the Agricultural Department of the Smithsonian Institution?

Such is the Department of Agriculture I should rejoice to see established in connection with an Institution designed to increase and diffuse "knowledge among men." In the arrangement I have imperfectly scanned, the interests of Science would be amply guarded, and the most important of all arts—the art of Culture—would be enriched with the gifts of Science.

The tillage of the soil is the honorable destiny of the largest part of our race. Hitherto it has been recommended by the independence, the healthfulness, the purity, the quiet, of rural life, and the loveliness of rural scenery. The country has inspired the poet's pen, and furnished the themes of his merriest songs. The peasant's cottage, the stately mansion, the undulating fields, the grazing herds, the waving grain, the laborer's rustic note, the murmuring brook, the woodland songster, the forest foliage, and the flowers—the beautiful flowers—are sacred to the strains of rural poetry. But the dignity and attractions of Science should now be added to the farmer's tranquil and happy home. Within the present century, an agricultural literature has been formed; and the tiller of the soil is expected to read and to think, as well as to plow. Agriculture is progressive. It is now thought possible that a farmer may be wise, and yet decline to walk in the footsteps of his fathers.—And why should Agriculture be stationary?—The spinning jenny has supplanted the distaff; the rail-car outruns the stage-coach, and steam has changed the commercial relations of the world. While the friendly hand of Science is pushing forward the other industrial pursuits of man, shall this alone, which employs and sustains nine-tenths of our race, receive no onward and elevating impulse?

It is moving onward with long and rapid steps. Europe is watching with favor the vast interests involved in the cultivation of the soil, and all ranks are uniting to hasten its improvement. They are actively employed in renovating their systems of Agriculture, both in theory and practice. Courts and nobility are honored to appear at the exhibitions and *fêtes* of Agricultural Societies and Associations; even the favorite Minister of absolute Austria protects with greater care than usual the cause of the plow. Science seeks to contribute its offerings. The Universities of Giesen and Durham, and the princely estates of Bechelbroun and Moglin, are among the distinguished scenes of its European triumphs. Associations for the protection and encouragement of Agriculture have been formed in every part of Great Britain, of France, and the States of Germany; and crowds of the laboring peasantry, the suffering many, aroused from the sleep of centuries—and kings, agents of the privileged few—unite to celebrate the victories of thriving husbandry, and to devise means for increasing the fertility of the soil which even the classic bard of Andes never conceived.

The people of the United States are deeply interested in this subject, and are beginning to feel its importance. The Agricultural Clubs, Societies and Associations recently formed and thickly scattered over the country, from Maine to Louisiana, attest the increased attention bestowed on Agriculture. Though American Science has failed to pursue this subject with its usual zeal and success, the efforts of Peters, Webster, Taylor, Wadsworth, Skinner, Seabrook, Ruffin, and others, have been attended with beneficial results to American husbandry.

With the aid of Science, the improvement of Agriculture among us will be uniform and sure. Not left to chance or luck, it will be directed by knowledge and skill. Science has shed her light on the rugged path of the laborer in almost every other form of industry, and Government has found it profitable to purchase her aid even in determining the nature and relative value of American coals.* Agriculture prays only for equality of benefits, for even-handed justice.—Assistance and guidance are needed. Let Science open the path and set up the way-posts, and the course of American Agriculture, like that of Europe, will be marked by certain and increasing speed. The language of Petzholdt, in his "Lectures to Farmers," is considered just and appropriate:—"When the scientific principles upon which the art of Agriculture depends shall be fully known, and the practice founded on it generally followed, the amount of our present crops will be as much a subject of tradition as the pace of the old stage-coach, which dawdled away *twenty-four* hours in accomplishing a journey of seventy miles, is to the present generation."

The present Congress, if it shall justly estimate the agricultural interests of the nation, and the value of those sciences with which they are identified—and shall see fit, in its wisdom, to es-

* Reference is here made to Prof. Johnson's Report on American Coals—a work creditable to its author and to American Science.

tablish, as part of the Smithsonian Institution, a Department of Agriculture similar to what I have here tried to set forth and vindicate—will bestow great and enduring benefits on the present and future generations, and be entitled to their grateful remembrance and profoundest veneration.

I have the honor to be,
With high respect, yours, truly,
J. W. HARDY.

Randolph, Macon College, Va., Jan. 7, 1846.

AGRICULTURAL EDUCATION.

Extract of a letter to the Editor, dated

"DUBLIN, N. H. Dec. 22, 1845.

"I have read all the numbers of your Library and Journal thus far, and I regard it as a most important publication, and though I am not a practical farmer, yet I am deeply interested in the subject, and hope that your labors will receive such encouragement as to induce you to continue them.

"I rejoice to see that you are resolved to urge the subject of Popular Education in the pages of your Journal. Farmers must be educated, or they will make no improvements. Too many, at the present day, have no taste for reading; they never learned to read with intelligence in their early years, and the consequence is, they regard all books and periodicals that treat of Agriculture as of no sort of value. They *are* of no value to *them*, for they cannot understand, and therefore cannot apply the principles of such works. Science in its applications to Agriculture should be taught thoroughly to all those who expect to cultivate the soil. This may be done even in common schools, but especially may it be done in high-schools and academies. Farmers should insist upon having Agricultural Seminaries, where practical instruction and training may be given in every thing that pertains to the farming interest. If farmers move in this manner, united, and say the word the thing will be done; legislators will not refuse to enact the necessary laws, nor to withhold the necessary funds.

Acts of legislation and appropriations of public money, for *diffusing education and knowledge immediately connected with practical Agriculture*, are about the last things that enter into the schemes of the partisan legislator. Propose to him something that *smacks of war and bloodshed*—some law that will create new offices to be filled, and a better chance for himself and friends to come in for a share of the public *treasure*—and he pricks up his ears, and looks and listens like a sportsman's dog at the smell or the sight of fresh game. But talk to him of establishing a *civil* institution, for spreading a knowledge of things that shall enable the *tiller of the soil* to analyze and better understand the value and application of all his resources, and you talk to him about what he does not comprehend, and the extent of all the inquiry he will take the trouble to make is, *How many votes will this measure bring me at the next election?* The only way, then, to cure the evil, and to bring about a course of legislation more conformable with the general interest, is, as our correspondent well says, by farmers' taking the matter into their own hands, and making legislators, who have not the public spirit and intelligence to take the lead, feel that *their popularity* depends on their better appreciation of the solid, substantial interests of society. Why do not all Agricultural Societies begin the work of awakening and reforming public sentiment on this subject? Let them begin by insisting that not *one dollar* be given to an officer of the Army or Navy without at least a like amount being given to the *civil engineer* and the *schoolmaster*. If the people are to be taxed eight millions a year, as now, for the military, let a like sum be appropriated for *good agricultural roads and good agricultural instruction*. Better, much better, for the people—a people boasting of their *republicanism*—to pay for institutions for *spreading knowledge* than for *shedding blood!* We invoke the coöperation of the general Press of the country.

How differently *they order things in France—monarchical France!*

"AGRICULTURAL SCIENCE IN FRANCE.—Mr. WALSH, in a recent letter from Paris, writes as follows:

"We have regular reports of the sittings of the Convention of the Agriculturalists of the North. The Government lends it all countenance and aid, and manifests a strong desire to establish societies and committees in every district of the realm. A general scheme for this purpose was submitted on the 7th instant to the Convention by the inspector general of Agriculture, and was freely and fully discussed."

POTATO DISEASE.—EFFECTS OF GUANO.

Extract of a letter to the Editor, dated

CATSKILL, Jan. 10, 1846.

Sir: In reading your remarks in your last Library on the experiments about to be tried at Baltimore upon the disease of Potatoes, I thought I would address you a private letter and give you my experience upon that subject. I removed to this place from New-York last Spring; I leased about twenty acres of land that was not under very good cultivation, but having had an early agricultural education, and an extravagant fondness for it, I made an excellent selection of soil and situation. I have been in the habit for several years past of reading all publications upon improved Agriculture I could find, so that my mind is pretty well stored with the different experiments that have been tried in Europe and America. On my leasing the place, having limited means, I set my wits to work to ascertain what would be the cheapest manure I could use, and decided upon Peruvian Guano, which I purchased of Mr. Bartlet. I then selected as a medium through which to

apply it, the dust and burned earth from charcoal pits which can be had here in any quantity delivered in our cellars for forty bushels. The manner of preparing and applying it was by dissolving the Guano in water as strong as the water would take it up. I then gathered a quantity of rich vegetative mould that had been accumulated from the wash of a farm for ten years past. I mixed that with the charcoal, and wet the whole compost with the Guano-water as much as it would receive. I let this compost lay about a week, preparing it from time to time, and at the time of applying it I mixed it with the insoluble Guano. My method of applying it to corn, potatoes, beets, carrots, and all other roots was to mark out the land with a small plow for hill-crops, and with a hand rake with teeth of a proper length, and such distance apart as was suited to what I planted in the garden.

For corn and potatoes I put into the hills before dropping the seed, about as much compost as could be held in one hand; on this I dropped the seed and covered it in the usual depth. My corn I soaked in Guano about thirty hours; the solution in which I soaked the corn was as strong as one pound to two gallons of water. One field of corn thus planted came up one inch above ground in thirty hours, which I can substantiate by several witnesses. Neither my corn nor potatoes were planted much after the 20th of May. The growth of them was more rapid than I ever saw before. My corn and potatoes were ripe as soon as any fields in the neighborhood that were planted a month earlier.

I did not have a potato affected with the rot. Other potato-fields in the same-time neighborhood were almost a total failure from the rot. Now, was it the Guano or Charcoal that prevented the disease?

I am preparing this winter several different kinds of manure, which I intend to experiment with this year in the same field. The result I will communicate to you in the autumn.

The coincidence between this case and that mentioned by Mr. Tescheumacher, where the planted acre of potatoes escaped the disease, would lead to the conclusion that it was the Guano which in this case saved the crop. Should these cases be corroborated by a few others, it will establish for that fertilizer another and a stronger claim on the attention of agriculturists.] [*Ed. Farm. Lib.*

SOUR THERAPY.—We have known several instances in which this discussing compound, even in its worst stages, has been immediately alleviated and speedily cured by the following remedy: Mix a pennyworth of pounded camphor with a wine-glass of brandy, pour a small quantity on a lump of sugar and allow it to dissolve in the mouth every hour. The third or fourth dose generally enables the patient to swallow with ease. [Medical Journal.

THE PROPER POSITION OF COUNTRY DWELLING-HOUSES AND BARNS.

WASHINGTON, D.C., Jan. 1851.

To the Editor of the Farmers' Library.

Dear Sir.—Your number for the month came safely to hand yesterday, and this evening was dedicated to a *pleasurable* perusal of its pages, which I did with the delight afforded by becoming improved prospects to the future of Agriculture and domestic rural life. Though from the vicissitudes of the world and the lots we have it in our power to choose, we are not favored, and not enjoy our favorite home, I am bereaved of even the hope to spend my latter days in that most beautiful of all occupations of man, DEAR FARM, yet there is no other occupation I so warmly pursue as that of the farm.

There are several heads of your last number in which I could comment, but in the present instance will move on a few lines—which you can use, if you think them worthy—on "Farm Buildings." On the mode and manner of construction I shall say nothing, as all these considerations must depend upon local circumstances; but on the position of Dwelling Houses there is, in my opinion, one great feature of the climate of our North America, some four of the warmer Northern Temperate Zone of the earth, which stands as a permanent law to decide the question. To place a Dwelling House with the walls along and in right angles to the meridians of our globe, is almost a matter of course, yet evidently the very worst position possible, when we *consider the prevailing winds*, which, if we do not find that the north-western current of air so far prevails in time and force as to bend, in great part, our forests and more particularly our orchards, to the south-eastward, we fail to discover that the farther we deviate from the customary placing of farm Dwelling-Houses, the more sheltered must be the south-east side? Or in other words, place the side-walls north-east and south-west, and the consequence follows that in the violent heats of our summers, as well as in the bracing storms of our winters, one side of the building, that to the north-west, defends and leaves the contrary side a cool retreat from one extreme, and a side secure from the opposite.

It would be difficult to discover more than one advantage gained by an east and west and north-and-south Dwelling House—that is, building in part, the office of a sun-dial—a dial purchased at an enormous price.

Since commencing these notes, I thought has struck me to furnish you with some plain drawings illustrative of what I have observed, and notes of the winds compiled by various observers both in Europe and America.

It may be observed in closing, in present, that such works as the Farmers' Library and Monthly

Journal of Agriculture have no small part of their value in their tendency to awaken inquiry into customs, of however long standing they may be, and to stimulate society to decide their value not by antiquity of custom, but by tested utility and conformity to the laws of Nature.

We may also extend these observations, and with even more propriety apply them to Barns. If a Barn is built, as it always ought to be, with two wings and an intervening space for threshing-floor, at least ten feet wide, all under the same roof, and placed lengthwise, as recommended for the Dwelling-House, wind-mills would become little more than an incumbrance. If, again, placed on sloping ground, the south-east exposure would afford to stock a like shelter from the winter blasts as promised above to the human. WILLIAM DARBY.

"L'ART DU MARAICHER."

Extract of a letter to the Editor.

"THERE is a subject, entirely new in this country, well worthy of investigation, if you could get hold of a book on the subject '*L'Art du Maraicher.*' You will better understand it by analyzing the word '*Maraicher:*' *marai* means marsh, or swamp; *cher* means dear.

"I have seen it practiced in France, without paying much attention to it. It is, however, a system of cultivating vegetables based upon large supplies of water; and this water is always obtained from wells by means of horse-power, driven by one horse. You can imagine what a fat, rich soil would do for us if always moist, when the thermometer ranges from 80 to 100, as it usually does here in summer.

"In England and France, owing to more moisture, they greatly excel us in the production of vegetables. Give us the moisture, and with our hot sun we can greatly surpass them. Near Paris, the horse that draws the water does all the other work about a vegetable garden.

"You want a paper on the cultivation of *liquorice.* Large quantities of it are reared in France in the latitude of Paris and farther south. You might learn something of it in New-York from the large druggists. That used in this country is, I think, all imported.

"*Irrigation* is another subject of great importance. In Italy the subject is so important, and the practice so universal as to require separate and special legislation. The day may be remote, but we will get to it eventually in this country. F. G. S."

NOTES ON THE ABOVE.—There is, indeed, room for inquiry and need for information about Liquorice. We import it all; and if it were not the product of *agricultural* labor, the home growth of it would doubtless be well protected; but farmers are the last of all classes to look after their particular interests and to see that they are provided for in the legislation of the country. Their Representatives are, for the most part, small politicians who regard their place in Congress as *an office*, in itself if they happen to be in the minority; and if of the dominant party, then they use it as a *stepping-stone* to office for themselves, or as affording them something to give in exchange for Executive favors to their families and friends. As *popularity*, not the permanent public interest, is, for the most part, the question with them, the only way to insure broad-bottomed, enlightened legislation, based on the welfare and true glory of the country, is to have an *educated, enlightened constituency.* But how is that to be obtained? The dear people will submit to taxes, and pay any thing that is demanded of them for *military* institutions and instruction; they will go down on their knees the more conveniently to take up *that* burden, under the charm of the drum and fife! But, with all their instinctive apprehension of what is popular, of what will "*please the people,*" do you ever see a Congressman proposing money or voting money for any road but a *military* road—for any school but a *military* school? Oh no, not he! He knows too well what will "go down at home"—what will please in Buncombe.

Liquorice *root* is sold in New-York for five cents a pound; the extract is fifteen cents. The chief supply is from Marseilles; the best from Spain—hence the famous "Spanish Liquorice." We wish our correspondent had the books, or that we had the time to look farther into this matter.

For Irrigation and Water Meadows.—We indicated our estimate of the importance of these subjects in an early number; and on page 463 (this month's issue) will be found an article on FLOODING MEADOWS. But these processes are very expensive where labor is so dear.—Yet, there are thousands of streams of water that might be used with great advantage and profit, that are now unused. We have as much of what we esteem to be very valuable matter, as will fill the March and April numbers; but all printed and selected articles are liable, before they are in type, to be superseded by original communications, and even to be postponed after they are in type, where circumstances require it. We solicit and give preference to original correspondence on subjects decidedly new and important; but we do not wish to tax our readers with pages of mere twaddle—old details reproduced; old stories vamped up, and stale subjects revived, or humbugs, such as "calico-corn," that serve, like June-bugs tied by the leg, to amuse, for the moment, men who "are but children of a larger growth." [*Ed. Farm. Lib.*

INDIAN CURE FOR THE SORE THROAT.—Three or four salt-water clams split and bound round the neck when swollen and inflamed, with a cloth, will effectually cure this disease. The clams to be renewed every four or five hours.

RAISING POTATOES FROM SEED.

BY THE EDITOR.

WASHINGTON, 28th Jan. 1846.

Chevalier FS. W. M. DE TESTA,
Chargé d'Affairs, &c. from the Netherlands:

Sir: In reference to the seed of the Potato, about which you honored me with inquiries, they have never been preserved, as is believed, in sufficient quantity to be a *marketable* article in this country; in fact, they have been *very rarely* saved by farmers for their own use; and to this may be attributed, in some measure, our want of new and good varieties. The eager temper and impatient habits of our people, their love of change, and propensity to migrate from place to place, produced in a great measure by the frequent and infinite division of estates and impoverishment of families, prevents the adoption, in agricultural matters, of *means* to *ends* which require years of patient attention before these ends can be consummated. Hence the destitution of the country, since the establishment of our independence, of fine orchards and of choice fruit, the possession of which, under the most favorable circumstances, requires years to realize, and which, after all, is only to be had, with certainty and abundance, by raising new varieties of fruit from the stones and seeds of peaches, apples, pears, &c. So with the Potato. The *seed*, as you well understand, is to be had from the Potato-*apple*, growing on the *top of the plant*. As in the case of fruit, there is no security in this that "like will produce like." The product from Potato-*seed* is various in color, shape, and qualities, and some years must elapse before the best varieties can be *established* and their qualities considered permanent. For this reason, no seedling Potatoes should be discarded till after trial of the third generation, nor a promising one be sooner trusted. It is only after the third year that full reliance can be placed on the permanence of characteristics as respects productiveness and other qualities.

The characteristics to be sought in the establishment of a new variety are—1st. Moderate size, which I am persuaded, on the whole, is most to be desired in animals, fowls, vegetables, &c. 2d. Regular shape; the eyes not deeply sunk. 3d. Not bursting when boiled. 4th. Dry or *mealy* when cooked. 5th. An agreeable taste. 6th. Early in maturity. 7th. Not too luxuriant in the stems. 8th. Productiveness. As with fruit from stone and seed, so there is no end to the varieties of shape, size, colors and qualities to be derived from the seed of the same Potato-apple. The roughness of the skin generally indicates dryness, the watery or waxy Potato being commonly smooth-skinned. Thirty seedling varieties have been gathered from spontaneous seedlings in a garden where only one kind of Potato had been planted. There is no fact in vegetable physiology better established than that *soil* has a powerful influence in changing the color, shape and qualities of the Potato no less than those of grain and tobacco. I observed this in the case of the famous *Rohan Potato*, one of the humbugs which a few years past served to amuse a credulous public, so that it sold in Philadelphia for $1 for a single tuber. The imported root was very large, and the quality waxy and coarse. In two generations planted on stiff white-oak land, manured, it yielded a very fine, smooth, middle-sized Potato, excellent for table use. It is clear, then, that every cultivator should raise seedling Potatoes until he establishes a variety suited to his soil, and one which he may then expect to endure.

Nothing in the annals of American Horticulture is better established than the origin of the "*Mercer Potato*," raised from *seed* planted in Mercer County, and regarded as one of the best and most popular varieties we have ever had.

There is no reason to believe that better Potatoes could be had from seed in this country than in Europe; nor is it probable that they will ever be saved in sufficient number to be on sale in the seed-stores. There is nothing more necessary than to gather the apple when ripe, separate the seed from the pulp, or perhaps to express the watery particles, leaving the seed in the residuum of the apple, and to preserve them until time for planting, which had better, in the first instance, be in a hot bed.

According to promise, I send you the February number of the Farmers' Library, (a monthly periodical devoted to Agriculture and its kindred studies and sciences,) with the dissertation of Professor MORREN on the origin of the Potato Disease, and would be gratified that he should know that, according to his wish, it has been published and spread before the cultivators of that valuable and important esculent in this country, but which our great staple and popular food, *Indian Corn*, renders of less material importance in this country than in those parts of Europe not suited to the growth of *maize*. If, sir, I can be at any time of any service in the interchange of agricultural knowledge or products between our countries, I pray you to rely with confidence on the humble instrumentality of one who can never be more happily employed.

With great respect, Sir, I have the honor to be your ob't serv't, J. S. SKINNER,
Edit. Farm. Library.

KITCHEN PEPPER.—Ginger 1 lb.; cinnamon, black pepper, allspice, and nutmegs, of each 8 oz; cloves 1 oz.; dry salt 6 lbs. Grind together. Useful to flavor gravies, &c.
(Cooley's Cyclopædia of Prac. Receipts.

PREPARATION OF SEED-CORN.

Important Suggestions.—Use of Copperas Water in the Preparation of Seed-Corn; By LANSING WETMORE, *of Penn.*

I BELIEVE you are apprised of the fact of my removal from the village on to my farm one mile above, on Conewango Creek. I am in the "full tide of successful experiment" on the new and most approved method of farming. I will communicate for the Farmers' Library an experiment which I made last season in raising Corn. The first of March last I commenced extracting pine stumps from a five-acre field. I had attempted to crop the field twice within the last five years. The stumps were so thick, however, there being about twenty-five on an acre, that the attempt was nearly fruitless. The first crop was oats; the yield was less than 12 bushels per acre; the next, spring wheat, and the yield less than 6 bushels per acre. I seeded it to clover and let it go to pasture—very poor at that—for the last three or four years. With the aid of Noreross's stump machine, which is one of the best and cheapest ever invented, my son, a lad fifteen years old, one horse and yoke of cattle to move the machine, we cleared the field of stumps by the first of May; made some 40 rods of first-rate fence with the best of the stumps, and burned the rest; drew on 12 loads of long manure per acre, spread it, and plowed it 7 inches deep; dragged it with the furrows; marked it off and planted 3 feet asunder each way. The produce of the five acres was 553 bushels of corn in the ear, 3000 pumpkins, and 25 bushels of excellent potatoes. My corn crop was increased about 33 per cent. by a simple preparation of the seed as follows:

At noon of the day before planting, 18th May, I put my Seed-Corn to soak in a strong decoction of copperas water, say 2 lbs. copperas to warm soft water sufficient to cover a bushel of corn. The next morning took out a peck, added a pint or more of soft soap, stirred it thoroughly, then put on plaster enough to make it convenient to drop for planting, say one quart. The whole field was planted with the seed thus prepared, except 4 rows, which were planted with seed without any preparation. The after-culture of the whole was alike—passing through each way with the cultivator, and hoeing twice. The four rows last mentioned were cut up, harvested, and the corn weighed and measured by itself; also four rows next adjoining, the seed of which had been prepared as above. The produce of the four rows of unprepared seed was eleven bushels and a half. The produce of the four rows from the prepared seed was seventeen bushels—a difference of five and a half bushels of ears in one hundred and twenty hills. The yield of the remainder of the field averaged fully equal to the four best rows measured.

The difference in the growth and appearance of the corn of the prepared and unprepared seed was striking from the time of its appearance above the ground until it tasseled—the former looking green and vigorous, the latter puny and yellow. It was all cut down by the frost when about three inches high, but came on finely after the first of June. There was scarcely a soft ear in the field, excepting on the four rows of unprepared seed. These were about a week later in ripening than that from the prepared seed. The soil is a sandy loam. The whole expense of preparing the bushel and three pecks of seed did not exceed 62½ cents. The increased produce of the field by preparing the seed was over 200 bushels ears.

LANSING WETMORE.

TO HAVE EARLY POTATOES.

THE destruction of the Potato crop in England had been so extensive as to make it proper to look ahead for the best means of hastening the crop forward in the Spring, it being important to shorten as much as possible the period of privation.

With a view to bring forward the next spring's crop at the earliest possible moment, the following suggestions have been made in the London Gardener's Chronicle.

Though not pressed by the same urgent necessity in this country, these suggestions may yet furnish hints to those who feel an ambition, both innocent and commendable, to have the earliest Potatoes on their own table—an ambition that deserves to be fostered, so long as it does not proceed from avaricious motives, or degenerate into envy of those who are winners in the race.

The writer recommends that recourse be had to the earliest known *varieties*, and then to keep in mind the following important facts, and the same general rules may be observed to get early sweet Potatoes:

1st. The eyes at the top of the Potato are the youngest and vegetate first; from them the crop will be about a fortnight earlier than that obtained from the lower part of the tuber.

2d. When the Potato is not cut, and the top eyes are allowed to proceed in their growth, the others push slowly, if at all.

3d. If the top sprout be removed, the other eyes will begin growing with greater vigor.

4th. It is, therefore, obvious that the top sprouts may be removed when they begin to show roots, and planted out for the earliest crop; whilst the rest of the tuber may be allowed to push the other eyes for a succession.

5th. In case of a scarcity of sets, the stems may be layered; they will root, and form a second crop of tubers; but this must be done early in the season, or before the first set of tubers is fully ripe, although large enough to be fit for use.

Men who are skillful propagators of plants (as many gardeners are, and all ought to be) will readily imagine what important advantages may be taken of these properties of the Potato. We

have long since been told that a Mr. DENSON, in 1834, propagated from three tubers plants enough to crop half a rod of ground, and obtained from them an amount of produce equal to 16 tons per acre, in the same season. What may not be expected now, with the invaluable aid of cheap glass!

In the mild climates of Cornwall, Devonshire, and many parts of Ireland, Potatoes may be immediately sprouted in a warm place, as in a cottage near the fire, or on hurdles in cow-houses, &c.; and when the sprouts are two inches long, they may be cut off, together with a portion of the tuber, and planted out in a sheltered spot, covering the sprouts with two inches of light soil. A slight covering will be sufficient to protect them from such frosts as occur in those parts in ordinary winters. They will produce a crop fit for use in the beginning of May.

In cold situations, and where proper protection cannot be afforded, it may be advisable to defer sprouting the sets till the end of January. They may then be pushed four inches by the middle of March, and planted out as soon as the weather will permit.

In planting for the earliest crop advantage should be taken of the most sheltered situations, such as the south side of walls, hedges, or fences. Where no such shelter can be obtained, ridges three feet apart should be formed, running east and west, and a furrow should then be made along the base on the south side for the dung, over which the sets should be placed, so that their tops on pushing, may appear half way up the side of the ridge. In such a position the roots derive warmth from the rays of the sun striking perpendicularly against the slope; and the top of the ridge affords shelter from northerly winds. If in addition furze, broom, straw, bunches of beech, spruce, &c., are stuck in the top of the ridge so as to project over the young plants, slight frosts will not injure them. If the soil about the plants can be covered with litter in cold nights, radiation of heat will be prevented: the litter should be removed during the day, and the surface frequently stirred. By these means an early crop may be taken off the ground in May, after which there is still time for a second crop.

SCHEME OF REDUCING THE QUANTITY OF COTTON.

REPORT OF THE COMMITTEE APPOINTED BY THE STATE AGRICULTURAL SOCIETY OF SOUTH CAROLINA TO TAKE INTO CONSIDERATION THE SCHEME OF REDUCING THE QUANTITY OF COTTON, SUGGESTED BY COL. DAVIE, AS A REMEDY FOR LOW PRICES.

ACCIDENT has delayed until now the publication of the following Report. It was not until the *February* number of this journal was in the hands of the stereotyper, that we received the copy of the Southern Agriculturist which is now used.

The additional facts here appended to the Report, go farther to show the falsity of the popular belief that the production of Cotton exceeds the consumption. These facts are drawn from the Report of the Committee of Commerce of the City of Charleston, on questions propounded by the Secretary of the Treasury, made to that officer on the 13th of November last.

J. B. O'NEALL, whose name is associated with Mr. SEABROOK, is a Judge of the Court of Common Pleas, and one of the most active and devoted friends of Agriculture in South Carolina; while Mr. S. himself is familiarly known to all as among the most enlightened and prominent friends of that branch of national industry.

We hail it as an evidence of a more lively and extended appreciation of a common interest among agriculturists, and the harbinger of a resolution on their part to protect their interest against ceaseless encroachments of parasitical classes, that the State Society of South Carolina, at its last session, should have instructed its Executive Committee to invite the State Agricultural Societies of the Union to attend their next annual meeting by delegations, who are to come prepared with written answers to such questions as may have been propounded to them in relation to the Agriculture of their respective States.

It will be lamented that his convenience has not allowed Hon. J. C. CALHOUN to comply with the request of the Society to deliver the next Annual Address. Mr. Calhoun has the reputation of being one of the very best practical planters in the country; but we hold that (whatever may be thought to the contrary) to be of less importance, on these occasions, than that the Orator should possess enlarged and comprehensive views of the political rights of Agriculture, and its connection with and paramount influence upon the destinies of the country—its right to a leading control over its legislation, and its liability to be postponed and made subservient to other and inferior classes and professions, whose social relations are more condensed—whose sympathies are more perfect—whose plans are more selfish, and whose concert is so much more complete.

Mr. MADISON was not a money-making farmer, yet his Address delivered before the Albemarle Agricultural Society, of which he was President, and published in the old American

Farmer. may be referred to, even now, as a model for such performances. The same may be said of Addresses by the late R. G. Harper and N. Biddle, and others of their high order of intellect.

The State Society of South Carolina having, by resolution, requested Mr. Seabrook to communicate to the public, before the planting season, such information as he may possess, or as it may be in his power to collect, in relation to the *means of modifying the effects of drouth on Indian Corn and other provisions*, all who possess any facts worthy of notice, that may cast light on the subject, will feel it to be a patriotic duty to contribute them through an organ so well qualified to make the best use of them. The inquiry has been suggested, we need hardly add. by the disastrous effects of the drouth of the last summer in that and other States—making it highly important that full and accurate information should be collected and disseminated.

REPORT ON THE SCHEME OF REDUCING THE QUANTITY OF COTTON GROWN.

The Committee to whom was referred the communication of Col. Davie, addressed to Hon. Geo. McDuffie, W. McWillie, and W. B. Seabrook, report—

That they have considered Col. Davie's scheme of a combination among the Cotton planters, to reduce the quantity planted, and thus enhance the price. They regard it. in the first place, as impracticable. The habits of planters are those of separate action: they combine less than any other class of men. Each regards his plantation as his empire: he looks around and considers what will best promote his individual interest; and though there is no doubt that many might be induced to meet, consult, and possibly write in favor of Col. Davie's project, yet some, and probably a great many, would prefer separate action, and thus destroy the scheme in the very outset.

The vast number of persons engaged in planting Cotton in the Southern and South-Western States, renders the whole project impossible.—What may be our interest in South Carolina, might not, and very probably would not, be the interest of the planters in Alabama, Mississippi, Arkansas, Louisiana, Florida and Texas. Their means of raising immense crops make them insensible to *that* which presses upon us with so much severity.

In the second place, your Committee are persuaded that, if such a scheme were practicable, it is by no means desirable that it should take place. For, in its most favorable action, it would in the end operate very much to the injury of the Cotton planters. If, by a reduction of one-half in the production, the price be raised one or two hundred per cent., the next season the quantity raised would be greatly increased, which would again reduce its value to a ruinous extent. Nothing can have more disastrous effects upon planters than this fluctuation from low prices to high, and from high to low. All which is necessary to our prosperity is a diminution of our wants, and a near approach to certainty in the market value of Cotton. Whether it be high or low is of little consequence. Every thing will soon conform to it. From the cheapness and superior quality of our Cotton, it has possession of the English manufactures in the ratio of nine to one. In the course of a few years, if we continue to increase the quantity, we shall, in a corresponding increasing ratio, diminish the production in East Indian and South American Cotton, and. at length, fairly drive all competition from the field, and thus secure a monopoly of Cotton in the markets of the world. This will give security to our domestic institutions. For, as soon as the world feel that they are dependent on us for the Cotton manufactured and worn by its millions, there will be no disposition to take from us our laborers, and thereby prevent the supply of so necessary an article.

But if we do not grow the quantity now exported, and keep pace with the increasing population and consumption of the world, the vacuum will have to be supplied by other nations. On looking at a statistical table, hereto annexed, it will be seen that almost every bale now exported is annually consumed in manufactures. This being so, it follows that the supply by us, or others, must meet the demand. This may be illustrated by reference to the state of things in the British West India Islands. The act of emancipation withdrew an immense amount of effective labor from the cultivation of sugar: it of course diminished the supply from them, but increased it in Demarara and Louisiana. The object of Great Britain in liberating her slaves was to pave the way to general emancipation in the West Indies and North America. So far she has failed in accomplishing it; and indeed, at present, it looks, from her importation of Africans and East Indians. as if she was half way repenting her folly. But we can render no more efficient service, in accomplishing her cherished object, than by diminishing our production of Cotton. When we shall do so, her East Indian provinces will come into the market, and supply what we have failed to do.—Let her once turn the current of trade, and give the monopoly to the East Indies which we now have, in a short time we shall be driven from the field. and then where is slavery? Our negroes will be valueless, and a burden; and, of course, their owners will cease to hold them.

Your Committee are fully convinced that there is not now, as is supposed, an over-production of Cotton; for there cannot be an over-production of an article which is annually consumed. That this is the case with Cotton appears from the statistical table.

The situation of distress in which we have been, and possibly still are, is not the result of over-production. It resulted from the visionary speculations of great financial and commercial schemes. Many indulged in fancies illusory as the South Sea scheme, and to the full as impossible, as the discovery of the famous *el dorado*. Such men gave to every thing a fancied value, which increased as their imaginations expanded—credit was unnaturally extended, until debt exceeded every possible means of payment.—Hence the revulsion of '37 and '38, and the prostration of much real, but more fancied wealth.

At the present moment we are recovering from *that*, by natural and proper means. Our Cotton at low prices is paying annually our debts, and compelling us to reduce our luxuries, and to pursue a just economy. The currency is gradually expanding through the operations of our well-regulated banks, so as to meet the wants of the people, and had it not been for the unpre-

cedented drouth and consequent loss of crops, wherewith it has pleased God to visit us, we should, in the next year, have reached a point of comparative safety and ease from the past pressure.

The extension of the production of Cotton is met by a corresponding demand. Nearly one-half of the population of Europe, especially France and Germany, have not now the comfort of a cotton shirt or cotton jacket. It has, therefore, this field as an untried market, but one which is every day opening more and more to our enterprise. To this must be added, that perseverance on our part will drive all competitors from the field, and when they turn their attention to some other branch of business, they must become our customers. Our American Cotton, and very probably our American Manufactures, are in time, and that a very short one, to be used by every civilized inhabitant, and also many a savage one, of the world.

But if the production of Cotton in the North American States was diminished one-half, the amount of misery which it would cause can hardly be realized. The cotton planter supports millions of human beings, and clothes hundreds of millions more. Let him extend his philanthropic labors; he will be benefited by them; and countless thousands will call him blessed. *At this time*, every indication points to an increase of price, such as the opening of the Chinese trade, the general soundness of the Currency, abundance of poor in England, the possible repeal of the duty on raw Cotton in every country, arising from competition among the manufactures, and the unprecedented demand for machinery in England, on the Continent, and in this country. To these encouraging circumstances it must be added, that probably the Tariff which has been to us the *source of so many troubles*, will, in a short time, come down to the Revenue standard. The evils under which we labor are not those of over-production. They arise from two other causes: one is that of over-legislation. Give us free trade—abolish the unnatural burdens which nations have imposed upon one another; in a word, let the planter be free, and his comforts would soon be duplicated. If the grower of Cotton could send his crop of Cotton to any part of the world, and receive in exchange for it commodities subject to a moderate duty, your Committee believe that the demand for American Cotton would be increased to four millions instead of two millions of bales. This we would be unable to furnish, for the land adapted to its growth is greater in quantity than will ever be cultivated—*the number of laborers is limited*. Unless the African slave trade be again opened, or the introduction of slaves from the West Indies be permitted, (of which no one dreams,) an increased cultivation can only arise from the withdrawal of laborers from the cultivation of rice, tobacco, and sugar, (than which nothing is less probable, especially in reference to the latter article,) an increase in population, and improved modes of cultivation. These sources of an increase of production are so limited that they never can meet the demand which would arise from free trade. We agree with a late writer, that "the American Tariff is the origin of all the hostility of foreign nations to the institutions of the South." It is clear to our minds that there can be no improvement in the business of planting until this unnatural hostility and its cause be removed. For every Southern planter feels his want of security; and the effect of this is increased upon him by the belief, in the non-slaveholding States, that slavery is to soon perish by its own weight. Let him and all others feel that he is secure in his property, and it will quadruple his energy and success.

Another cause of our distress is that, in a large portion of the Southern country, Cotton is cultivated, when its production does not now, and never can, at all compensate the planter for the labor bestowed. *Then* it is desirable for every one that other branches of industry should be pursued. In such sections, manufactures may be most profitably substituted; and every manufactory established will be not only additional wealth to the proprietors and the country, but will also materially aid the cotton planter by increasing the consumption.

We do not intend to encourage the cultivation of Cotton to the neglect of the other products necessary to support or comfort. Every planter should promptly render himself independent, in reference to those articles which could be produced on his plantation. In this way he would profitably curtail the quantity of land devoted to the cotton crop. An abandonment of the present extremely defective mode of culture, and the substitution of a better, would ensure a larger quantity of Cotton than would be lost by diversifying the products of industry. In other words, his cotton crop would be larger; his corn, wheat, rice, oats, barley, horses, mules, hogs, cattle, sheep, butter, and vegetables, would be the produce of his farm.

If, however, the cotton crop is to be given up one-half, after all the reductions of it which we have sanctioned, to what else can the planter of the South so profitably turn his attention? To grain? He already, *in ordinary years*, produces twice as much as the Middle States, and about one-eighth more than the West. In Indian corn alone, the produce of the South, by her last census, was 200 million bushels. If the planter of Cotton is engaged in an unprofitable business, much more is the grain raised. The interest on capital invested in Agriculture at the North is less than three per cent.; *here* it is about four per cent That the rice and tobacco culture might be profitably extended in this State, and will be in the South-West and Texas, is true. Millions of acres in South Carolina, including the lower country, are admirably adapted to the raising of rich grasses. This might be added as another branch of industry, from which reasonable profits could be realized, and might very well be added to the cotton planters' income. The business of tanning and the manufactures of leather might be and ought to be enlarged. In this State, all the means of a successful pursuit of this branch of industry are at hand and within the reach of every one. Hides, lime, bark, and mechanics, (slaves,) are abundant—A few years ago, the capital engaged in this branch of industry in Massachusetts was $14,000,000, while that of Cotton was $13,000,000, and wool less than $11,000,000.

Another great inducement to South Carolina to persevere in the cultivation of Cotton (where, in reference to quantity, it can be advantageously grown) is that it is now highly probable that very many planters in Mississippi, Louisiana, and Texas, will in future direct their attention to tobacco and sugar. Their lands are well adapted to these productions, and the reduction of the duty on American sugar in Great Britain is one strong reason why the culture should be extended.

For these reasons, your Committee disapprove of any scheme which would have a tendency to materially abridge the quantity of Cotton produced. Indeed, they trust that it will continue to increase, and carry its blessings as it were on the wings of the wind, until every inhabitant shall fully realize the benefit of cotton fabrics for all the purposes to which wool, flax, silk and hemp, have been heretofore devoted.

WHITEMARSH B. SEABROOK,
JOHN BELTON O'NEALL.

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Col. M'Willie's absence from South-Carolina, and Mr. M'Duffie's ill health, prevented the Committee from enjoying the benefit of their services and counsel. Mr. Alston concurs in the entire report except a single sentence: and his reasons for that dissent are appended.

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I concur in the opinion that Col. Davie's plan of reducing the cotton crop, by obtaining an agreement among the planters to plant one-half or two-thirds of a crop, is impracticable.

I also believe that it is the true policy of the Southern or cotton growing States, to retain, by all means in their power, their ascendency in the cotton markets of the world, and to do nothing calculated to encourage the extension of the growth of Cotton in in other portions of the world.

I however, disagree to the opinion that "there is not now an over-production of Cotton." I am inclined to believe that the low prices are to be ascribed *mainly* to the heavy crops. It is familiar to all who have been in the habit of attending to the accounts brought from Europe by the different arrivals of vessels, *that the prices there are controlled principally by the latest accounts* from this side of the water, *of the prospects of the coming crop, or the probable amount of the supply of Cotton* from the United States. If the latest accounts from America had been, that the prospect was good, or in favor of a large supply, then the prices there (in Europe) fell, and *vice versa*.

And these accounts from America seem to have a greater control than all other causes combined. The reduction of price of the raw material induces, to some extent, an increase of the consumption, by enabling the manufacturer to make and sell the manufactured goods a little lower. But when we consider how little must be the cost of the raw material contained in a yard of heavy cotton goods—even at 10 cents per pound of the Cotton, we cannot suppose that the price of the raw material can have much influence in increasing or diminishing the consumption, unless the price should be much higher than it has been for many years. Take the cost of the raw Cotton in a yard of manufactured cotton goods, (even at 10 cents per pound,) from the price of that yard of goods, and it will show, that if the consumption is governed by the price of the manufactured goods, it is mainly by the cost of the manufacturing—not of the raw material.

It seems to me that if the consumption kept pace with the production, the price would not be affected by it either way, to any great extent; but that if the manufacturer had always found a ready market for his goods, he would have continued to purchase the Cotton at the usual price, and therefore there would be but little variation in the price of Cotton. On the contrary, however, the manufacturer could not obtain a market for his goods—they would accumulate upon his hands—he would be compelled to reduce the wages of his operatives, or stop his manufacturing machines. He could not afford to buy Cotton any longer, unless at reduded prices, and in less quantities. There being difficulties in getting off manufactures, unless at reduced prices, a like difficulty in selling the raw Cotton would be produced, unless at reduced prices. The prices then must come down.

I will not extend my remarks. The report, in other respects, I concur in. I would prefer that portion, or sentence, stricken out, as I am inclined to thing that its omission would not be inconsistent with the rest of the Report.

Respectfully,
W. J. ALSTON.

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[The cotton crop of the United States, of 1844, was 2,400,000 bales—the largest ever made; notwithstanding, the stocks in the American ports on the 30th of August, the end of the cotton year, were less than they were on the 30th of August, 1844.....65,646 bales.

By the last dates from Havre, the stocks of American Cotton were less than last year at the same time.....19,500 "

85,146 "

In Liverpool, they were more than at the same time last year.....64,300 "

Making a deficiency in stock of...20,846 bales, as compared with the same periods of 1844, notwithstanding a crop of 2,400,000 bales.

The stocks in the other Continental ports cannot be stated, but they are not large. The stocks in spinners' hands in France are moderate. In England they are large, but much smaller, compared with the extent of their trade, than it was their practice to hold some few years since. It is not unreasonable to assume, therefore, that had not the consumption been curtailed in the United States, by the excessive duties on imports, and more especially those on the coarser kinds of cotton goods, the consumption of Cotton at this time, would not only have been larger, but quite sufficient to have kept pace with the production, without the disproportionate decline in price that has taken place between it and the articles manufactured from it.]

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Import of Cotton, expressed in 1,000*s of bales.*

From	1841.	1842.	1843.	1844.
United States	1,387	1,534	1,904	1,682
Brazil	100	104	115	123
West Indies	72	72	49	47
East Indies	324	316	227	299
Egypt	123	108	469	126

Stocks imported, and consumption of Cotton in Europe, reduced to bales of 300 *lbs. each.*

	Imports.	Consumption.
1841	2,291,010	2,215,026
1842	2,477,266	2,422,926
1843	2,949,000	2,654,000
1844	2,736,843	2,667,469

From the above, it appears that in 1841, the imports exceeded the consumption, 75,984; 1842, 54,340; 1843, 295,000; 1844, 69,374 bales.

Stock 1*st of January.*

1841.	1842.	1843.	1844.	1845.
777,610	863,421	926,102	1,239,000	1,321,726

Total deliveries, from which are deducted intermediate shipments, or surplus of exports from

Great Britain; also the stock on hand, 31st Dec., and to which are added the stock on hand, Jan. 1st, expressed in 1000s of bales:

1841.	1842.	1843.	1844.
1,846	2,005	2,155	2,127

Importation.—It will be seen (says the Circular,) that there is a decrease from the United States of about 200,000 bags, and from Egypt of 60,000 bags, whilst from the East Indies is an increase of 55,000 bags, and a trifle from the Brazils, which leaves, on the aggregate, a deficiency of about 200,000 bags; but the excess in the stocks at the beginning of the year, made up the aggregate supply fully to what it was in the previous year.

[The above is extracted from the Circular of Collman and Stotterfoght, dated Liverpool, 31st January, 1845.] [*Columbia South Carolinian.*

SOUTHERN HEMP, OR BEAR GRASS.

We find in the Tallahassee Floridian of the 15th (says the New-Orleans Bulletin) the following letter from Gov. Call to Gov. Moseley, in relation to the cultivation of Hemp from the plant known by the name of Bear Grass, and indigenous to the Southern States. The Floridian introduces the letter with some remarks on the agricultural advantages and the products of Florida from which we give a short extract:

"We have heretofore remarked that we believed there was no country under the sun where the honest, industrious cultivator of the soil could obtain a living with more ease and less labor than in Florida. We are every day becoming more and more convinced of this fact. The salubrity and healthfulness of the climate, the richness and fertility of the soil, the variety of productions, and the ease with which they can be cultivated, all prove this. Almost every year we have a new article introduced in the cultivation, which has been neglected or overlooked for years past, in the all-absorbing mania for raising cotton. In some parts of the Peninsula we can raise most of the tropical fruits in perfection; in all parts many of them; and in quantities, if the culture is properly attended to, to render their production profitable. With the people of Florida, then, there is no necessity of confining themselves to one particular. We have before noticed some of the most profitable productions—cotton, sugar, tobacco, &c. We have this week a new article to notice, which has heretofore been neglected—the Bear Grass. We have been informed by an intelligent merchant of St. Marks that, a year or two since, he received and forwarded cotton from a Georgia planter, roped with the rope made on his own plantation from the Bear Grass; and that, but for the fact that it was not quite so well manufactured, it would not have been distinguished from the regular Manilla."

Tallahassee, Nov. 8, 1845.

To his Excellency, Wm. D. Moseley,
Governor of the State of Florida:

Sir: I have the honor to present to your Excellency a specimen of the Florida Hemp, produced from the plant generally known by the name of "Bear Grass." It abounds in Florida in its native, uncultivated condition, and it is believed that it may be propagated to an indefinite extent. Nothing feeds upon it, and it therefore requires no enclosure. It grows in the forest frequently to the hight of three or four feet, and, no doubt, may be improved by cultivation. It loses scarcely anything by the process of manufactory—the Hemp being about the same length as the leaf. It is found indigenous in most of the Southern States, and, though being neglected and unnoticed, from the successful results of experiments recently made, I feel assured it is destined very soon to become one of the most valuable staples of our country. In the present depressed situation of the cotton market, owing to the superabundant production of that article, such a result is greatly to be desired. And if my anticipations are realized, the Southern Hemp will become more abundant and more profitable than that of the North, and will contribute but little less than cotton to the population, wealth and power of the Southern States.

The resemblance of the Hemp of Florida, both in its native condition and after its manufacture, to that of Manilla, induces a belief that it is equal in value if not superior to that article, and that the same process may be required for its cultivation and preparation for market. Although I am well satisfied with the result of the experiments I have recently made for the latter purpose, and am convinced that, without any improvement whatever in the method I have pursued, the labor of every hand engaged in its production will be more than twice the value of the same amount of labor employed in a cotton field, yet it may be found, on inquiry in the country where the Manilla Hemp has been produced for so many years, that a much better plan has been produced by long experience. Deeming this a subject highly worthy of inquiry, I would respectfully suggest to your Excellency the expediency (should you think favorably of the proposition) of requesting of the Government of the United States, through some of our foreign Consuls, to obtain all the practicable information in regard to the cultivation and preparation of this valuable article of commerce.

The experiments I have made have been as simple and expeditious as they have been satisfactory in their results. The leaves of the plants have been plucked from the bud, around which they cluster, tied up in convenient bundles, boiled, and pounded, until the green bark and soft vegetable matter is disengaged from the strong fibres, when they are put in water, and washed out with great ease.

But the apparatus I have suggested, and in which I have great confidence, (sufficient to prepare from two to three tons per day,) is a heavy wooden wheel, to traverse a circular platform, firmly constructed and covered with strong plank. The wheel to turn on a shaft, carved in the form of a screw. One end of the shaft confined and turning on a pivot in the center of the platform, which will cause the wheel in its revolutions to traverse every part of the platform. The action of the boiling water for twenty-five

minutes will prepare the leaves for the wheel. The bundles, which will then have shrunk considerably, should be re-tied, to prevent the tangling of the Hemp, placed carefully on the platform, until it is covered, and the wheel put in motion by the animals hitched to the outer end of the shaft, and moving in a circle on the outer edge of the platform. When the wheel shall have reached one side of the platform, by its revolution on the screw, the animals moving it are to be turned and driven in the opposite direction around the circle, which will cause the wheel to traverse back again to the opposite side. While the wheel is in motion, water should be frequently thrown on the plants, which being permitted to escape by vents from the platform, carries with it all the surplus matter, in a state of solution, disengaged from the strong fibres by the friction and pressure of the wheel, until the Hemp is washed perfectly clean. It should then be taken from the platform and hung out to dry, which completes the process of preparation, and the article is ready to be packed up for market.—This process will succeed until a better is devised.

Every good plant will produce one pound of clean Hemp. Some have exceeded that quantity. The best specimens from the uncultivated plant are from three to four feet long, and the fibres coarse or finer, in proportion to the age of the leaf, as you will perceive by comparing the smaller parcel I send you, (composed of the bud leaves only,) with the larger. From five to six thousand plants may be produced from one acre, which will yield as many pounds of good Hemp. The specimens I have shown are estimated, by our most intelligent merchants, as superior to the Manilla, and are considered worth from eight to ten cents per pound in the New-York market. At these prices, there is no cultivation in the United States so valuable.

I have made experiments on the plant known by the name of the "Spanish Bayonet," which abounds on our Southern sea-board, and find the fibre equally good in every other respect, though not so large as that of the "Bear Grass." I learn from men who have been accustomed to cut up the latter plant annually in the cultivation of their fields, that it is almost indestructible. Should this be the case, it would require to be planted but once, after which it will continue through a succession of years to yield its valuable tribute without cultivation. Such results, though very imperfectly realized, will render the Florida Hemp a most important production. It will add to the prosperity of the wealthy, give profitable employment to the laboring classes, both in Agriculture and manufactories, but to the poor it will be an inestimable blessing. It will invite emigration, ensure a dense white population, and make the South the richest and most powerful portion of the country.—Cotton and Sugar can never be produced in great abundance except by slave labor, and the employment of a capital far beyond the reach of the poor. Their culture has therefore a tendency to increase the number of slave, and exclude a white population. But should the Hemp become a valuable staple, as I confidently anticipate it will from the simplicity and care of its culture, and abundant production, it will give the richest and most generous reward to the laborer. There are none so poor as to be unable to avail themselves of its advantages to some extent. The bounty of Providence has placed it within their reach. The production of a few acres will yield a sufficient support for a small family at greatly reduced prices; and where they may not be able to procure the necessary apparatus for boiling the Hemp, the same result may be produced by steeping it in cold water for the space of twenty days, after which they can prepare more of it for market with their fingers alone in one day, than they can pick of cotton in two. Let the culture be once introduced, and it will never be abandoned while good Hemp is worth two cents per pound. I have the honor to be

Very respectfully, your ob't servant,

R. K. CALL.

ALPACCA SHEEP.—We have been waiting for an opportunity to *re*-call public attention to this animal—we say *re*-call, because we believe (not having the volumes exactly at hand) that about *twenty years have elapsed*, since we caused the several varieties of Peruvian Sheep, and among them the Alpacca, to be engraved for the "AMERICAN FARMER," and by aid of Mr. Robinson, author of the History of Mexico, pointed out their peculiar adaptation to our *Southern mountain lands*, and, in the most emphatic manner dwelt upon the advantages that ought to be expected from their importation.

It was the year after *guano* was distributed, and the whole story told of the qualities and advantages of *both*; but nothing but English experience and English recommendation, it seems, will go down with our people. When we come to re-publish what was then said of these animals, we shall see how much or how little of any thing *new* has been discovered, since Robinson described them, to prompt the disposition which we now rejoice to see prevails in various quarters, to send out and import them.

But we here throw out, not any settled conviction, but a strong impression, that they will not be found to answer in cold regions. We shall endeavor to find room in a subsequent number for what may be useful and necessary for the curious or interested inquirer.

Since writing the above, we have seen it stated by Professor Johnson in one of his lectures, that a friend of his had found that they will not thrive and do well in Scotland.

The following may be instanced as among the promising signs of the times:

Extract from a letter to the Editor of the Farmers' Library, dated WINCHESTER, Kentucky.

"We are about forming a company to send to Peru for the Alpacca, and wish to gain all the information we can on the subject."

HUNT'S ECONOMICAL BREAKFAST POWDER. Rye roasted along with a little fat. *Use.* As a substitute for foreign coffee, of which it is one of the cheapest and best.

[Cooley's Cyclopædia of Prac. Receipts.

INSECTS INJURIOUS TO VEGETATION.

REPORT ON THE

INSECTS OF MASSACHUSETTS INJURIOUS TO VEGETATION, BY THADDEUS WM. HARRIS.

On undertaking to conduct a periodical designed to be useful, not only by illustrating practical Agriculture and detailing the result of actual experiments in the field, but by exhorting young farmers to extend the range of their reading and to cultivate a fondness for the study of sciences and literature that bear relation to practical Agriculture, we considered it to be one of our first duties to recommend, in the strongest terms we could employ, the *study of Entomology*, or the character and habits of *Insects*. For motives to prompt the young farmer to this field of investigation, we need go no farther than to the very first sentence in the book before us—a work which we earnestly commend on its own merits, and for the benefit of the agriculturist, and not to serve any interest of either author or publisher.

"The benefits which we derive from insects," says Doctor Harris, "though neither few in number nor inconsiderable in amount, are, if we except those of the silk-worm, the bee and the cochineal, not very obvious, and are wholly beyond our influence. On the contrary, the injuries that we suffer from them are becoming yearly more apparent, and are more or less within our control. Before suitable remedies can be discovered and effectually applied, it is necessary that our insect enemies should be recognized, and their habits generally known."

This account of the insects injurious to vegetation in Massachusetts, which appears to have been prepared under instructions from Governor Everett, is doubtless applicable in a great degree to the whole Union. The very suggestion of such a work showed enlarged and liberal views on the part of a Chief Magistrate of a State, and is enough, in connection with the general knowledge of *his* various and elegant attainments, to warrant the supposition or inquiry whether these instructions themselves would not have formed an interesting preface or appendage to a performance which in our humble opinion seems to have been executed with the judgment and zeal of a disinterested naturalist and accomplished scholar.

As to the general plan of the work, the author observes—

"While I have not thought it expedient to avoid the use of a scientific classification, and have even been at some pains to point out the characters on which this classification is founded, and the peculiarities of the various groups of insects under consideration, it has been my endeavor to treat the subject in a plain and familiar way. No more of the technical language of Entomology has been introduced, than was absolutely necessary to define and discriminate the different insects, whose transformations are described, and in most cases the scientific names and terms have been explained whenever they occurred."

The following passages are all for which we can find room; but these are full of instruction for those who have not turned their attention to this interesting branch of Natural History, and will of themselves awaken the young reader to some sense of the vast field which displays itself for his amusement and instruction—one for which he has no distance to travel, for it is open to him on every side, with objects innumerable to occupy in the most agreeable manner many moments of leisure for which the uninstructed can find no employment, and hence are liable every day to be overcome with listless ennui.

> "The primrose by the river's brim
> A simple primrose is to him,
> And it is nothing more."

As this Report is designed for the use of persons who may not have elementary and other works on this branch of Natural History at their command, it may be proper to begin with some brief remarks on insects in general, in order to show how they are formed, and wherein they differ essentially from other animals.

The word *Insect*,* which, in the Latin language, whence it was derived, means cut into or notched, was designed to express one of the chief characters of this group of animals, whose body is marked by several cross-lines or incisions. The parts between these cross-lines are called segments or rings, and consist of a number of jointed pieces, more or less movable on each other.

Insects have a very small brain, and, instead of a spinal marrow, a kind of knotted cord, extending from the brain to the hinder extremity; and numerous small, whitish threads, which are the nerves, spread from the brain and knots, in various directions. Two long air-pipes, within their bodies, together with an immense number of smaller pipes, supply the want of lungs, and carry the air to every part. Insects do not breathe through their mouths, but through little holes, called spiracles, generally nine in num-

* *Insectum* is an abbreviation of *intersectum*; and from the same source we have the word intersect, to cut or divide.

ber, along each side of the body. Some, however, have the breathing-holes placed in the hinder extremity, and a few young water-insects breathe by means of gills. The heart is a long tube, lying under the skin of the back, having little holes on each side for the admission of the juices of the body, which are prevented from escaping again by valves or clappers, formed to close the holes within. Moreover, this tubular heart is divided into several chambers, by transverse partitions, in each of which there is a hole shut by a valve, which allows the blood to flow only from the hinder to the fore part of the heart, and prevents it from passing in the contrary direction. The blood, which is a colorless or yellowish fluid, does not circulate in proper arteries and veins; but is driven from the fore part of the heart into the head, and thence escapes into the body, where it is mingled with the nutritive juices that filter through the sides of the intestines, and the mingled fluid penetrates the crevices among the flesh and other internal parts, flowing along the sides of the air-pipes, whereby it receives from the air that influence which renders it fitted to nourish the frame, and maintain life.

All insects are produced from eggs, and none are spontaneously generated from putrid animal or vegetable matter. A few insects, such as some plant-lice, do not lay their eggs, but retain them within their bodies till the young are ready to escape. Other insects invariably lay their eggs where their young, as soon as they are hatched, will find a plentiful supply of food immediately within their reach.

Most insects, in the course of their lives, are subject to very great changes of form, attended by equally remarkable changes in their habits and propensities. These changes, transformations, or *metamorphoses*, as they are called, might cause the same insect, at different ages, to be mistaken for as many different animals. For example, a caterpillar, after feeding upon leaves till it is fully grown, retires into some place of concealment, casts off its caterpillar skin, and presents itself in an entirely different form, one wherein it has neither the power of moving about, nor of taking food; in fact, in this its second or chrysalis state, the insect seems to be a lifeless, oblong, oval or conical body, without a distinct head, or movable limbs; after resting a while, an inward struggle begins, the chrysalis skin bursts open, and from the rent issues a butterfly, or a moth, whose small, flabby wings soon extend and harden, and become fitted to bear away the insect in search of the honeyed juice of flowers and other liquids that suffice for its nourishment.

The little fish-like animals that swim about in vessels of stagnant water, and devour the living atoms that swarm in the same situations, soon come to maturity, cast their skins, and take another form, wherein they remain rolled up like a ball, and either float at the surface of the water, for the purpose of breathing through the two tunnel-shaped tubes on the top of their backs, or, if disturbed, suddenly uncurl their bodies, and whirl over and over from one side of the vessel to the other. In the course of a few days these little water-tumblers are ready for another transformation; the skin splits on the back between the breathing-tubes, the head, body, and limbs of a musketo suddenly burst from the opening, the slender legs rest on the empty skin till the latter fills with water and sinks, when the insect abandons its native element, spreads its tiny wings, and flies away, piping its war-note, and thirsting for the blood which its natural weapons enable it to draw from its unlucky victims.

The full-fed maggot, that has rioted in filth till its tender skin seems ready to burst with repletion, when the appointed time arrives, leaves the offensive matters it was ordained to assist in removing, and gets into some convenient hole or crevice: then its body contracts or shortens, and becomes egg-shaped, while the skin hardens, and turns brown and dry, so that, under this form, the creature appears more like a seed than a living animal; after some time passed in this inactive and equivocal form, during which wonderful changes have taken place within the seed-like shell, one end of the shell is forced off, and from the inside comes forth a buzzing fly, that drops its former filthy habits with its cast-off dress, and now with a more refined taste, seeks only to lap the solid viands of our tables, or sip the liquid contents of our cups.

Caterpillars, grubs, and maggots undergo a complete transformation in coming to maturity; but there are other insects, such as crickets, grasshoppers, bugs, and plant-lice, which, though differing a good deal in the young and adult states, are not subject to so great a change, their transformations being only partial. For instance, the young grasshopper comes from the egg a wingless insect, and consequently unable to move from place to place, in any other way than by the use of its legs; as it grows larger it is soon obliged to cast off its skin, and, after one or two moultings, its body not only increases in size, but becomes proportionally longer than before, while little stump-like wings begin to make their appearance on the top of the back. After this, the grasshopper continues to eat voraciously, grows larger and larger, and hops about without any aid from its short and motionless wings, repeatedly casts off its outgrown skin, appearing each time with still longer wings, and more perfectly formed limbs, till at length it ceases to grow, and, shedding its skin for the last time, it comes forth a perfectly formed and matured grasshopper, with the power of spreading its ample wings, and of using them in flight.

Hence there are three periods in the life of an insect, more or less distinctly marked by corresponding changes in the form, powers and habits. In the first, or period of infancy, an insect is technically called a *larva*, a word signifying a mask, because therein its future form is more or less masked or concealed. This name is not only applied to grubs, caterpillars, and maggots, and to other insects that undergo a complete transformation, but also to young and wingless grasshoppers, and bugs, and indeed to all young insects before the wings begin to appear. In this first period, which is generally much the longest, insects are always wingless, pass most of their time in eating, grow rapidly, and usually cast off their skins repeatedly. The second period, wherein those insects that undergo a partial transformation, retain their activity and their appetites for food, continue to grow, and acquire the rudiments of wings, while others at this age, entirely lose their larva form, take no food, and remain at rest in a death-like sleep—is called the *pupa* state, from a slight resemblance that some of the latter present to an infant trussed in bandages, as was the fashion among the Romans. The pupæ from caterpillars, however, are more commonly called chrysalids, because some of them,

as the name implies, are gilt or adorned with golden spots; and grubs, after their first transformation, are often named nymphs, for what reason does not appear. At the end of the second period insects again shed their skins, and come forth fully grown, and (with few exceptions) provided with wings. They thus enter upon their last or adult state, wherein they no longer increase in size, and during which they provide for a continuation of their kind. This period usually lasts only a short time, for most insects die immediately after their eggs are laid. Bees, wasps, and ants, however, which live in society, and labor together for the common good of their communities, continue much longer in the adult state.

In winged or adult insects, two of the transverse incisions, with which they are marked, are deeper than the rest, so that the body seems to consist of three principal portions, the first whereof is the head, the second or middle portion of the thorax, or chest, and the third or hindmost the abdomen, or hind-body. In some wingless insects these three portions are also to be seen; but in most young insects, or larvæ, the body consists of the head, and a series of twelve rings of segments, the thorax not being distinctly separated from the hinder part of the body, as may be perceived in caterpillars, grubs, and maggots.

The eyes of adult insects, though apparently two in number, are compound, each consisting of a great number of single eyes closely united together, and incapable of being rolled in their sockets. Such also are the eyes of the larvæ, and of the active pupæ of those insects that undergo an imperfect transformation. Moreover, many winged insects have one, two, or three little single eyes, placed near each other on the crown of the head, and called *ocelli*, or eyelets. The eyes of grubs, caterpillars, and of other completely transforming larvæ, are not compounded, but consist of five or six eyelets clustered together, without touching, on each side of the head; some, however, such as maggots, are totally blind. Near to the eyes are two jointed members, named *antennæ*, corresponding, for the most part, in situation, with the ears of other animals, and supposed to be connected with the sense of hearing, of touch, or of both united. The antennæ are very short in larvæ, and of various sizes and forms in other insects.

The mouth of some insects is made for biting, that of others for taking food only by suction. In biting insects the parts of the mouth, which are variously modified to suit the nature of the food, are these: an upper and an under lip, two nippers or jaws on each side, moving sidewise, and not up and down, and four or six little jointed members, called *palpi* or feelers, whereof two belong to the lower lip, and one or two to each of the lower jaws. The mouth of sucking insects consists essentially of these same parts, but so different in their shape and in the purposes for which they are designed, that the resemblance between them and those of biting insects is not easily recognized. Thus the jaws of caterpillars are transformed to a spiral sucking-tube in butterflies and moths, and those of maggots to a hard proboscis, fitted for piercing, as in the musketo and horse-fly, or to one of softer consistence, and ending with fleshy lips for lapping, as in common flies; while in bugs, plant-lice, and some other insects resembling them, the parts of the mouth undergo no essential change from infancy to the adult state, but are formed into a long, hard, and jointed beak, bent under the breast when not in use, and designed only for making punctures and drawing in liquid nourishment.

The parts belonging to the thorax are the wings and the legs. The former are two or four in number, and vary greatly in form and consistence, in the situation of the wing-bones or veins, as they are generally called, and in their position or the manner in which they are closed or folded when at rest. The under-side of the thorax is the breast, and to this are fixed the legs, which are six in number in adult insects, and in the larvæ and pupæ of those that are subject only to a partial transformation. The parts of the legs are the hip-joint, by which the leg is fastened to the body, the thigh, the shank (*tibia*), and the foot, the latter consisting sometimes of one joint only, more often of two three, four or five pieces (*tarsi*), connected end to end, like the joints of the finger, and armed at the extremity with one or two claws. Of the larvæ that undergo a complete transformation, maggots and some others are destitute of legs; many grubs have six, namely a pair beneath the under-side of the first three segments, and sometimes an additional fleshy prop-leg under the hindmost extremity; caterpillars and false caterpillars have, besides the six true legs attached to the first three rings, several fleshy prop-like legs, amounting sometimes to ten or sixteen in number, placed in pairs beneath the other segments.

The abdomen or hindmost, and, as to size, the principal part of the body, contains the organs of digestion, and other internal parts, and to it also belong the piercer and the sting with which many winged or adult insects are provided. The piercer is sometimes only a flexible or a jointed tube, capable of being thrust out of the end of the body, and is used for conducting the eggs into the crevices or holes where they are to be laid. In some other insects it consists of a kind of scabbard, containing a central borer, or instruments like saws, designed for making holes wherein the eggs are to be inserted. The sting, in like manner, consists of a sheath enclosing a sharp instrument for inflicting wounds, connected wherewith in the inside of the body is a bag of venom or poison. The parts belonging to the abdomen of larvæ are various, but are mostly designed to aid them in their motions, or to provide for their respiration.

An English entomologist has stated, that, on an average, there are six distinct insects to one plant. This proportion is probably too great for our country, where vast tracts are covered with forests, and the other original vegetable races still hold possession of the soil. There are above 1200 flowering plants in Massachusetts, and it will be within bounds to estimate the species of insects at 4800, or in the proportion of four to one plant. To facilitate the study of such an immense number, some kind of classification is necessary; it will be useful to adopt one, even in describing the few species now before us. The basis of this classification is founded upon the structure of the mouth, in the adult state, the number and nature of the wings, and the transformations. The first great divisions are called orders, of which the following seven are very generally adopted by naturalists.

It appears to us that every intelligent farmer would find the above-named Report a valuable acquisition to his library. On no subject con-

nected with Agriculture is there so little accurate knowledge diffused among the mass of farmers. An acquaintance with Doctor Harris's book will save them much anxiety and many fruitless efforts, besides serving to beget and to gratify a taste for researches that will impress him with the truth of the remark by another modern and most able foreign writer on the same subject, that "Whatever many may say of Nature growing old, the naturalist finds her always young and beautiful, always estimable—just as she came from the hand of her Creator, and as she indeed every moment issues afresh from the hand of the Almighty Being. In his hand the youth of Nature is continually renewed; and under his all-ruling Providence, all the millions of apparently distinctive beings only labor in preserving her existence and embellishment." This able Report appears to have been published agreeably to an order of the Legislature of Massachusetts, by the Commissioners of the Zoological and Botanical Survey of the State, and is, we believe, "out of print."

FRUIT-TREE BORDERS.

[From the London Gardener's Chronicle, 27th Dec. 1845.]

NOTHING can be of greater importance to a country gentleman than a flourishing and productive garden: and if proper means are allowed, there can be no reason why this should not be the case. True, there are adverse situations and soils, opposed in some degree to the quality of their productions; but gardening is an art, and he who aspires at a masterly knowledge of that art, by dexterity and perseverance renders every opposing object subservient to his skill. A thorough and enthusiastic cultivator of the soil reduces its obstinacy, corrects its barrenness, and causes the bark-bound, stunted trees to assume a living and vigorous appearance. It may be assumed that these are hidden and abstruse matters, which belong exclusively to science, but we deny it; good gardeners know all this, and bad ones should set about learning without delay. Let such begin by casting off their prejudices; let them take their stand by the side of the inquiring and industrious, and their course and success are alike clear.

All Fruit-Trees, of whatever kind, should be planted on shallow ground, more especially if the quality of the soil is adhesive. As a first principle, the border should be dry; and, if not naturally so, drainage, complete and efficient, must be introduced. The drainage must, from its depth, entirely prevent the roots from getting beyond it. The soil between the drainage and the atmosphere should be rendered friable by exposure to the elements, and when it partakes of considerable tenacity I would urgently recommend an admixture of stones, flints, brickbats, or any similar material, say to the extent of one-fourth. These will enable the rains to percolate freely through the body of earth in which the roots are. They will also in dry weather hold moisture, and tend greatly to maintain the border in an equable state. The roots under such circumstances will be satisfactorily placed; no water can remain or be held in the soil sufficiently long to prove injurious: the stones intermixed with the soil will allow it freely to pass into the drainage beneath, where preparation must have been made for its passing readily off.

No kind of fruit-bearing tree should ever be planted deep, the proper position of the roots in planting is to stretch them carefully on the surface of the border, then to cover them loosely with soil to the depth of three inches; on this lay a slight covering of decayed leaves, merely to protect them from drying winds until the roots are perfectly established in the soil. The roots are certain to find their way downward, but when they are down they are not so likely to find their way toward the surface.

Fruit-tree borders should never be dug with the spade. The surface may be stirred and kept open with the fork, and then merely for the purpose of loosening the soil. The roots should be encouraged to the surface by the application of dressings of decomposed leaves. Wood-ashes will occasionally prove useful, and so will soot. These encourage the kind of wood likely to prove productive, and the produce is entirely different, both as regards size and quality, from that where heavy dressings of stable manure are applied, particularly when the borders are imperfectly drained, and the soil of considerable adhesiveness. Manure dug into borders thus circumstanced is only increasing the evil. The soil is constantly wet and spongy. The roots are surrounded with unhealthy fluid; the air never penetrates beyond the surface; consequently, rank and barren wood, in large quantities, is annually, and to no useful purpose, produced. The roots should never be allowed, if it can possibly be avoided, to get beyond the reach of atmospheric influences. It is in such a position alone that they can procure and assimilate the kind of aliment indispensable to the fruitfulness of the trees. When the borders are imperfectly drained, the fruit produced is not only small in quantity, but of inferior quality, and not fit for dessert or kitchen use, compared with such as is grown on dry and healthy soil. Where the situation is bad, it should not by bad gardening be made worse; every means should be adopted to modify an evil, of itself of sufficient magnitude. I should hope that nobody would ever think of planting trees in future without a complete examination of the condition of the soil, and particularly the subsoil, in order, if necessary, to apply those remedies which skillful gardening may suggest; and surely there is sufficient skill and talent among us to meet, if brought into the field, all the exigencies of the case.

ONE WHO HAS HANDLED THE SPADE.

IMPORTING SOCIETIES.

We have already suggested, under deep conviction of its importance, that besides Agricultural Clubs, which should be formed in every neighborhood, there should be Societies established for the attainment of the highest attainable perfection in *particular branches* of Husbandry. We have alluded to the benefit which would result from, and the obligation which rests upon Agricultural Societies and Institutes to bestow a portion of their time and funds in the way of importing such new seeds, grains, fruits, grasses, and implements, as the higher rewards offered by similar societies abroad may have brought into notice and successful operation. In most cases—in fact, in all cases—where the thing imported might be found practicable and adapted to our country, seedsmen and machinists, as the case might happen to be, would, doubtless, take them at cost, and the country would at once enjoy the benefit of their importation and use.

This may be said, too, of animals, as well as of fowls, of machinery, trees, plants, and other things. All that the Society would have to do—and that is the natural and legitimate object of all such Associations—would be to *run the risk of failure*; a risk which the most public spirited individuals are generally unable, and the most opulent unwilling, to encounter, if the thing in view is very costly.

Take, for instance, the following account of a *cart*, so constructed, as it would seem, as to relieve the painful and dangerous pressure of the breechin on the horse, in descending a hill with a heavy load. Unless the principle of it can be so well comprehended as to supersede the necessity of importation, why not send for one, and let the country enjoy the benefit of it? But what is everybody's business is nobody's. For what better object, then, could Societies be formed, than to keep a look-out for, and at once import, whatever a competent committee shall decide to be worthy of importation and trial?—Or, the better to avoid all mistake, where the case is at all doubtful, such Society, by committee, might open a correspondence, and thus, by obtaining descriptions and drawings, assure itself of the worthiness, labor saving properties, or other valuable qualities of the things in view. How much more fruitful of real service to the country would be a few hundred dollars thus expended, than when given in premiums, for the thousandth time, to tempt men to experiments that develop nothing new—expenditures that true economy would forbid.

Let us cite, in way of example, the advantage we derive in this way from the *intellectual* discoveries and dissertations of men of the first abilities in Europe. Societies, with ample funds and judgment highly enlightened, offer gold medals, and other premiums, amounting, in many cases, to several hundred dollars, for best essays on subjects that demand patient experiment and profound investigation by men of the most ample means and of the greatest force of intellect. No sooner are these prize essays made public than they reach our table, and thus become the property of our patrons. Let, then, societies, representing the interests we are advocating, import, for the benefit of their constituents, what cannot otherwise be obtained.—Where drawings are procured, we engage to have them engraved, and widely spread before the public, for public use.

To the Editor of the Mark-Lane Express:

Sir—In reply to the inquiry of "A Farmer," in the Mark Lane Express of Sept. 22, I beg to inform him that I am the maker of an improved one-horse cart, fitted with "Thatcher's patent self-acting break." It is expressly adapted for hilly counties.

By this simple invention, the pressure of a loaded cart, when descending a hill, is made to pass from the breechin and back of the horse to the naves of the wheels. It is found to be effective in relieving the horse from the heavy pressure, and in regulating the speed of the cart in its descent.

	£	s.	d.
Price of one-horse cart, to carry 30 cwt.....	10	10	0
" Harvest shelvings to ditto, extra....	2	10	0
" Patent self-acting break, extra.....	2	10	0

For farther information, apply to

Yours, &c. WILLIAM CROSSKILL.

Beverley Iron-Works, Hull, Yorkshire.

Remedy for Lockjaw.—Having seen in the Argus of the 21st, an account of the death of the son of Mr. Andrews Wasson, from lockjaw from a nail accidentally run into his foot, I would state for the benefit of those afflicted from similar causes, that a common cent, or a piece of copper bound firmly upon the wounded part, and in actual contact with it, will cause almost immediate and entire relief, and cause the wound to speedily heal, whether it be made by rusty nail, steel instrument, splinter, or any other cause, either in foot, hand or other part of the body.

N. B. Rusty or tarnished copper is preferable to bright copper, though either will answer.

[Correspondent of the Albany Argus.

face of the thighs, encroaching upon the outer surface to the points A A, (Plate 1, Order I,) and then contracting as it extends upward to the points B B, on each side of the vulva, and about four inches* distant from it. They generally have, above the hind teats, two small oval marks, formed by hair growing downward, each of which is about two inches wide by three inches long. These marks are distinguishable also by their color, which is paler than that of the surrounding upward-growing hair.

In the First Order of this Class, the skin of the inner surface of the thighs and adjacent parts, up to the vulva, is of a yellowish color, with here and there a black spot. A sort of bran or dandruf detaches from it.

All Cows whose escutcheon corresponds, in its general shape or outline, with the one here described and seen in the plate, modified as it is in the various Orders, belong to this Class, whatever may be their color or their breed.

Second Order.—Cows of this Order yield, while at the hight of their flow, *eighteen litres* a day; and they continue to give milk until they are eight months gone with calf.

The marks of this Order are exactly like those of the First Order, (they are designated in the Plate by the same letters,) except that to the right of the vulva and near it there is a streak of hair growing downward (F). This mark is about four-tenths of an inch wide by two and a half inches long; the hair within it is very short. It indicates that the daily yield of the Cow diminishes by about one-sixth, upon her being got with calf.

Third Order.—Cows of this Order yield, while at the hight of their flow, *sixteen litres* a day, and continue to give milk until they are seven months gone with calf.

Their escutcheon resembles in shape that of the preceding Orders. It differs therefrom in having within it a semi-circle (C) of downward-growing hair, embracing the vulva and extending about one and a half inches below it, while it is about two and a half inches in width. The hair within this semi-circle is more shining and of a lighter color than the ascending hair around. In this Order there is but one oval (E) above the teats, to the left.

Fourth Order.—Cows of this Order yield, while at the hight of their flow, *fourteen litres*, and continue to give milk until six months gone with calf.

The escutcheon differs from those above described in being more contracted—the upward-growing hair occupying less surface. The points A A are not so far apart, and consequently nearer to the inside of the thighs. The points B B are nearer to the vulva—distant from it only about four-tenths of an inch. From these points there is a growth of downward-growing hair, which encloses the vulva, forming with it the two triangles seen in the Plate, one side of which is B C. These triangles also are distinguishable by the hair being more lustrous and of a lighter color.

Fifth Order.—Cows of this Order yield, while at the hight of their flow, *twelve litres* a day, and continue to give milk until they are five months gone with calf.

The escutcheon of this Order, as compared with that of the preceding, is somewhat narrower at the points A A and B B. Below the vulva, there is a streak of descending hair (C) about six inches long by a little over one inch wide. This

* The French measures, which are given in the fractions of the *metre*, have been reduced to English inches. The reduction is not, in every instance, absolutely exact; but it is sufficiently so for practical purposes.

escutcheon is distinguished also by a growth of descending hair (G) on the right thigh, which, beginning at A, encroaches upon the ascending hair, running into the inner surface of the thigh, to the distance of about six inches.

Sixth Order.—Cows of this Order yield, during the hight of their flow, *nine litres* a day, and continue to give milk until four months gone with calf.

The escutcheon of this Order has the same figure as that of the Fifth, only it is more contracted at the points A A. On both thighs there is a growth of descending hair (G G), which runs into the inner surface of the thigh, forming a triangle, the sides of which are about four inches and two inches in length.—Below the vulva is the same mark (C) as in the preceding Order.

Seventh Order.—Cows of this Order yield, while at the hight of their flow, *six litres* a day, and continue to give milk until three months gone with calf.

In this Order, as is seen in the Drawing, the upper part of the escutcheon is entirely wanting on the right side. On the left side it is well defined, though on a very contracted scale, between the points A and B. On the right side, the lower portion of the escutcheon terminates at a point in the line where the two thighs join; that is to say, in a line with the vulva. To the right of this line, the only trace of the wanting half of the escutcheon, above the point just mentioned, consists in a few hairs bristling up against each other.

In this Order the udder is generally covered with a thin growth of coarse hair.

Eighth Order.—Cows of this Order yield, while at the hight of their flow, *four litres* a day, and continue to give milk until two months gone with calf.

The escutcheon is the same as that just described, only yet more contracted and imperfect. Here and there, on each side, a few scattering hairs bristle up within the space occupied by the escutcheon in the more perfect Orders.

What has been said of the distinctive marks of the several Orders of this Class holds good, whatever may be the size of the Cow, except that the *dimensions* above given, having reference to tall Cows, are to be proportionally reduced in regard to those of the other two sizes. Respecting the latter, therefore, it is requisite to state only their yield and the time during which they continue to give milk.

COW OF MEDIUM HIGHT.

First Order.—Cows of the First Order of this Size yield, during the hight of their flow, *sixteen litres* a day; and, like those of the High Size, they continue to give milk until they are eight months gone with calf—the yield gradually diminishing from the time they conceive anew.

Second Order.—These Cows yield *fourteen litres* a day, and continue to give milk until seven months gone with calf.

Third Order.—These Cows yield *twelve litres* a day, and continue to give milk until six months gone with calf.

Fourth Order.—These Cows yield *ten litres* a day, and continue to give milk until five months gone with calf.

Fifth Order.—These Cows yield *eight litres* a day, and continue to give milk until four months gone with calf.

Sixth Order.—These Cows yield *five litres* a day, and continue to give milk until three months gone with calf.

Seventh Order.—These Cows yield *three litres* a day, and continue to give milk until two months gone with calf.

EIGHTH ORDER.—These Cows yield *two litres* a day, and they continue to give milk only until they have conceived anew.

LOW COW.

FIRST ORDER.—Cows of the First Order of this Size yield, while at the hight of their flow, *twelve litres* a day; and they continue to give milk until they are eight months gone with calf—the yield gradually diminishing from the time they conceive anew.

SECOND ORDER.—These Cows yield *ten litres* a day, and continue to give milk until seven months gone with calf.

THIRD ORDER.—These Cows yield *eight litres* a day, and continue to give milk until six months gone with calf.

FOURTH ORDER.—These Cows yield *six litres* a day, and continue to give milk until five months gone with calf.

FIFTH ORDER.—These Cows yield *four litres* a day, and continue to give milk until four months gone with calf.

SIXTH ORDER.—These Cows yield *three litres* a day, and continue to give milk until two months gone with calf.

SEVENTH ORDER.—These Cows yield *two litres* a day, and continue to give milk until one month gone with calf.

EIGHTH ORDER.—These Cows yield *one litre* a day, and continue to give milk only until they have conceived anew.

BASTARD OF THE FLANDERS COW.

Upon entering on the description of these Bastards, I will observe that I shall confine myself to Cows of the High Size; because, to apply the description to those of the smaller sizes, all that will be requisite is to reduce the dimensions of the marks in proportion to the smallness of the Cow.

The Flanders Cow has two varieties of Bastards, (Plate IX, Fig. 1 and 2.)—The first has, within the escutcheon of ascending hair, an oval (J) of downward-growing hair, just below the vulva, and in a line with it, distant therefrom about eight inches. This oval is about four inches long, by about two and a half inches wide; and the hair within it is invariably of a lighter color than that around.—The larger the oval is, the more rapidly will the Cow lose her milk and go dry upon being got with calf. The smaller it is, the less rapid will be the loss of milk; but it will not the less certainly take place, in a notable degree, in every Cow that bears this mark. It will be perceived that the Drawing represents the Cow of the First Order only—this being sufficient to make the reader well enough acquainted with the mark to recognize it when it occurs in Cows of the inferior Orders.

The Bastard No. 2 may be known by the circumstance that the upward-growing hair which forms the escutcheon, instead of lying smooth and pointing straight upward, bristles up like the beards of an ear of wheat, and projects crosswise over the outline of the escutcheon at the points A A. The more extensive the surface of the escutcheon is, and the finer and smoother the hair growing within it, the more abundant is the yield of milk. When this hair is coarse, long and scanty, it indicates a thin, serous milk.

In the Bastards, the skin on the interior of the thighs, up to the vulva, is generally of a reddish color; it is smooth to the touch, and yields no dandruf.

CLASS II.

The Selvage Cow.

The shape of the escutcheon of this Class is very different from that of the First. The upper part of this escutcheon consists, as is seen in the Drawing, (Plate II.) of a growth of ascending hair, rising vertically, and without any interruption from descending hair, to the vulva. Its resemblance to the list or selvage of a piece of cloth is what suggested the name that I have given to this Class.

HIGH COW.

First Order.—Cows of this Order yield, during the hight of their flow, *eighteen litres* a day, and continue to give milk until they are eight months gone with calf. Like those of the First Order of the First Class, they never go dry, if we choose to milk them all the time.

The udder is delicate and covered with a fine, downy hair, growing upward.—The escutcheon consists of a growth of ascending hair, commencing between the fore teats, and also on the inner surface of the thighs just above the hock joint. It expands as it extends upward, till it reaches the points A A. Here it is bounded by a right line, which runs across the inner side of the thigh, from A A to the points D D, which are about four inches distant from each other. From these points right lines rise vertically to the vulva, where they terminate, about an inch and a half apart.

Above the two hind teats, and nearly in a vertical line with them, are two oval marks (E E), formed by a growth of descending hair, distinguishable by its lustre, the size of which is about the same as in the Flanders Cow.

In these Cows, also, the skin of the inner surface of the thighs is of a yellowish color.

Second Order.—These Cows yield, while at the hight of their flow, *sixteen litres* a day, and continue to give milk until seven and a half months gone with calf.

The escutcheon is the same as that of the First Order, only the points A A are not so high up, and the entire figure is on a rather smaller scale. To the left of the vulva, outside of the escutcheon, is a small streak of ascending hair (E), about two and three-fourths inches long by less than half an inch wide. There is but one oval above the hind teats, on the left side. The entire escutcheon is distinguishable by the hair within being more glossy than that around it.

Third Order.—These Cows yield, while at the hight of their flow, *fourteen litres* a day, and they continue to give milk until they are six months gone with calf.

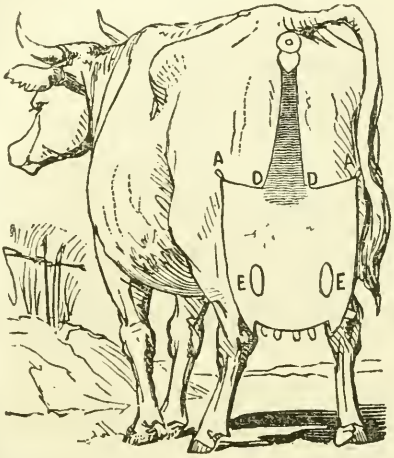
The escutcheon differs from the preceding in the following particulars: it is on a smaller scale; the points A A are nearer to the points D D, and the lines which rise from the latter points meet at the vulva, so as to form an acute angle. On each side of the vulva is a streak of ascending hair (F F,) of the same size as the one in the preceding order; that on the right being, however, sensibly shorter than the one on the left. There is, also, but one of the oval marks (E) above the teats, to the left.

Fourth Order.—These Cows yield, while at the hight of their flow, *twelve litres* a day, and continue to give milk until they are four and a half months gone with calf.

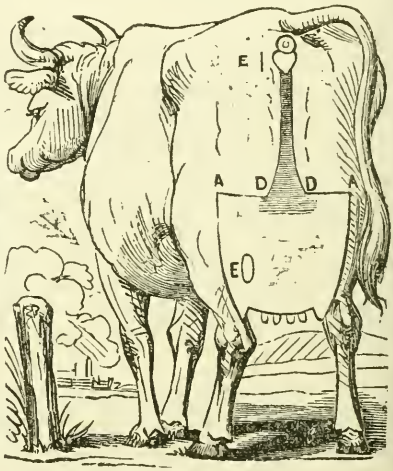
Table II.....Class 2.

THE SELVAGE COW.

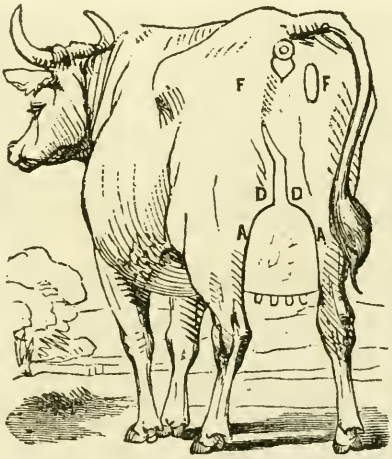
Order 1st.



Order 2d.



Order 5th.



Order 6th.

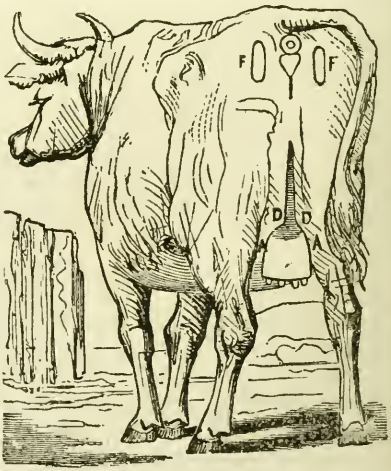
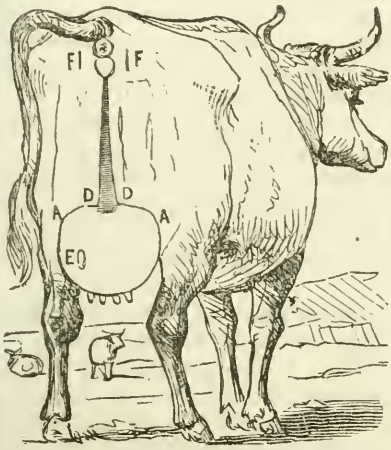


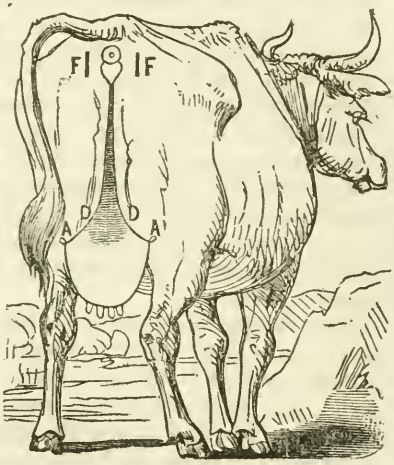
Table II.....Class 2.

THE SELVAGE COW.

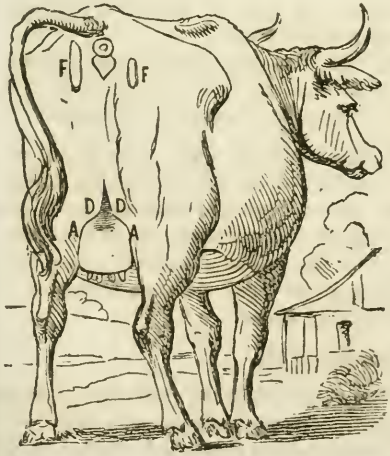
Order 3d.



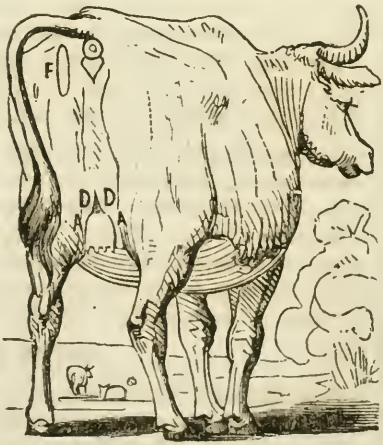
Order 4th.



Order 7th.



Order 8th.



The escutcheon is like that of the preceding order, with the difference that the points A A are considerably lower down than the points D D. The two streaks of ascending hair, on the right and left of the vulva, are longer by nearly an inch, and also wider than in the Third Order; and there is no oval mark above the teats.

Fifth Order.—These Cows yield, during the hight of their flow, *ten litres* a day, and continue to give milk until they are three months gone with calf.

The escutcheon is on a smaller scale than in the Fourth Order; the points D D are much nearer together—the distance between them being less than one inch; the list or selvage, as it rises toward the vulva, takes a turn to the left—its width contracting very much—and runs up, past the lower extremity of the vulva, to the point F. There is but one streak of ascending hair (F) on the right of the vulva, six inches long by an inch and a half wide.

Sixth Order.—These Cows yield, while at the hight of their flow, *eight litres* a day, and continue to give milk until they are two months gone with calf.

The escutcheon is yet more contracted than the one last described; the selvage is very narrow, and terminates in a point, about four inches from its base. There are two streaks of ascending hair, to the right and left of the vulva, of about the same size as the one in the fifth order; that is to say, six inches long by one and a half in width.

Seventh Order.—These Cows yield, during the hight of their flow, *six litres* a day, and continue to give milk until they are one month gone with calf.

The escutcheon is still smaller than the last; the selvage being now nothing more than a small angular projection of upward growing hair, in the direction of the vulva. There are two streaks of ascending hair (F F) on the right and left of the vulva. The one on the left is nearly eight inches long by an inch and a half wide; and consists of coarse hair, which, in growing upward, deflects crosswise toward the outer part of the thigh. The one on the right is of the same width, but only half as long as the other; it consists of hair growing in the same way.

Eighth Order.—These Cows yield, during the hight of their flow, *four litres* a day, and cease to give milk upon being got with calf.

The escutcheon is exceedingly small; the selvage is but a mere projecting point; there is but one streak at the side of the vulva, on the left; which is formed of a scanty growth of coarse hairs, bristling up and deflecting crosswise.

The remark made above, in regard to the First Class, I will here repeat with respect to the present and to the remaining six: all that is said of the different orders of the high size, so far as regards their characteristic marks, holds good of the same Orders in the other sizes, except as to the dimensions of the marks, which are to be proportionally reduced. On the subject of the two lower sizes, I shall therefore confine myself to the yield of milk, and the time during which the Cow continues to give milk after conceiving anew.

COW OF MEDIUM HIGHT.

First Order.—These Cows yield, during the hight of their flow, *fourteen litres* a day, and continue to give milk until eight months gone with calf.

Second Order.—These Cows yield *thirteen litres* a day, and continue to give milk until six and a half months gone with calf.

Third Order.—These Cows yield *eleven litres* a day, and continue to give milk until five months gone with calf.

FOURTH ORDER.—These Cows yield *ten litres* a day, and continue to give milk until four months gone with calf.

FIFTH ORDER.—These Cows yield *eight litres* a day, and continue to give milk until three months gone with calf.

SIXTH ORDER.—These Cows yield *six litres* a day, and continue to give milk until two months gone with calf.

SEVENTH ORDER.—These Cows yield *four litres* a day, and continue to give milk until they have conceived anew.

EIGHTH ORDER.—These Cows yield *three litres* a day, and go dry upon being impregnated anew.

LOW COW.

FIRST ORDER.—These Cows yield, during the hight of their flow, *ten litres* a day; and continue to give milk until they are eight months gone with calf.

SECOND ORDER.—These Cows yield *eight litres* a day, and continue to give milk until they are six and a half months gone with calf.

THIRD ORDER.—These Cows yield *six litres* a day, and continue to give milk until five months gone with calf.

FOURTH ORDER.—These Cows yield *four litres* a day, and continue to give milk until four months gone with calf.

FIFTH ORDER.—These Cows yield *three litres* a day, and continue to give milk until three months gone with calf.

SIXTH ORDER.—These Cows yield *two litres* a day, and continue to give milk until two months gone with calf.

SEVENTH ORDER.—These Cows also yield *two litres* a day, but they go dry upon conceiving anew.

EIGHTH ORDER.—These Cows yield but *one litre* a day, and cease to give milk upon conceiving anew.

BASTARD OF THE SELVAGE COW

The Bastards of this Class, (see Plate IX. Fig. 3) whatever may be their size and the Order to which they belong, are to be known by two patches of ascending hair, (F F) on the right and left of the vulva, distant from it an inch and a quarter to an inch and a half. They are from four to five inches long by about an inch and a half wide. The smaller they are, and the finer the hair within them, the less rapid is the loss of milk which they always indicate. When they consist of coarse hair, and terminate in a point at each end, they indicate that the milk is poor and serous.

CLASS III.

The Curveline Cow.

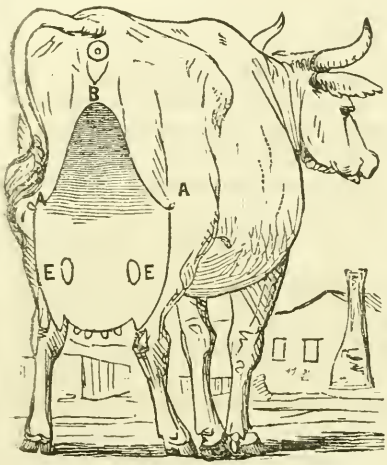
I have given this name to the Cows of my Third Class, because their escutcheon, which is lozenge-shaped, is bounded above by two curved lines; which, commencing to the right and left on the thighs, run up toward the vulva, and meet at a point below it. (See Plate III.)

This Class is a very numerous one; and, in regard to the yield of milk, approximates to the First Class. Cows belonging to it, and to every one of its Orders,

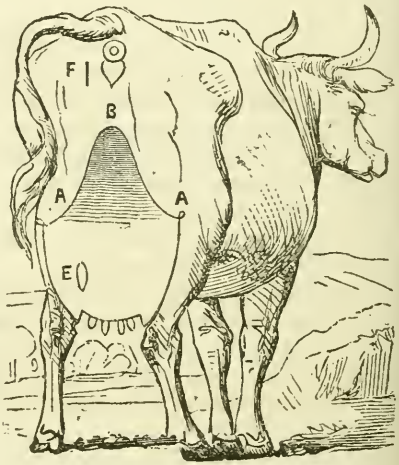
Table III.....Class 3.

THE CURVELINE COW.

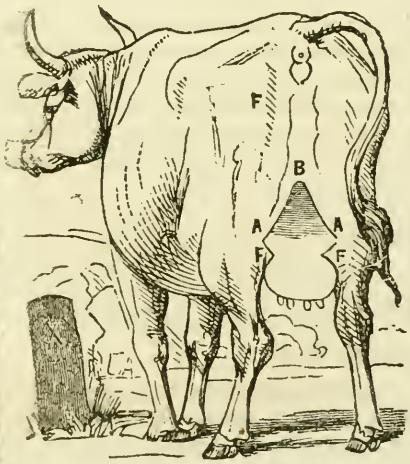
Order 1st.



Order 2d.



Order 5th.



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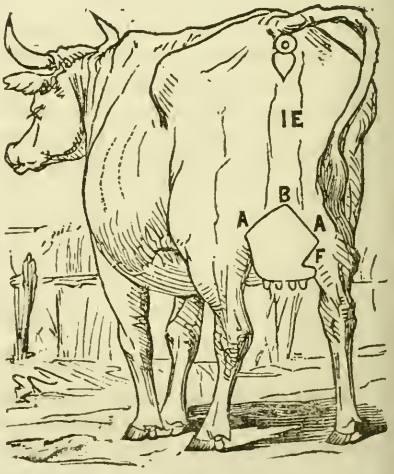
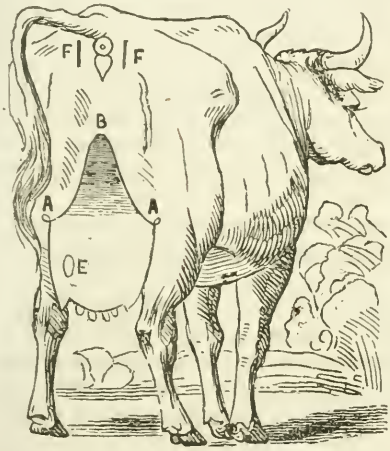


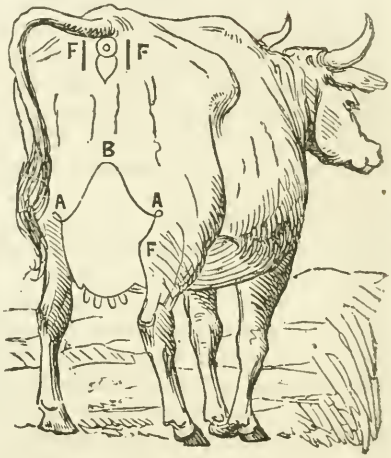
Table III.....Class 3.

THE CURVELINE COW.

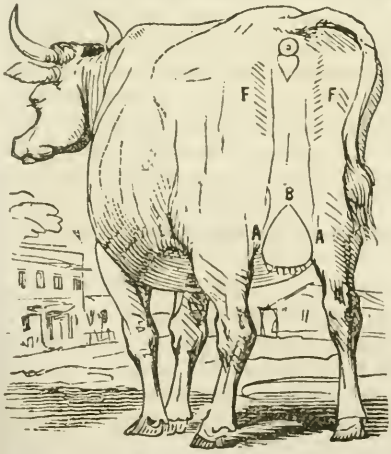
Order 3d.



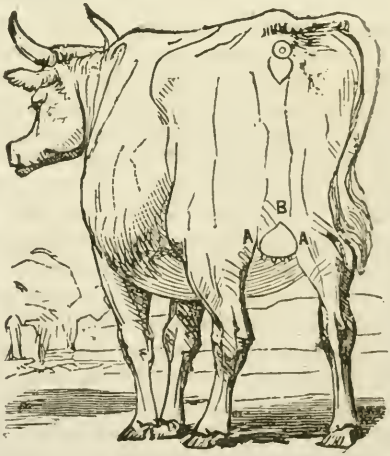
Order 4th.



Order 7th.



Order 8th.



are found in all breeds. The yield varies according to the Order and the size, just as in the First and Second Classes.

HIGH COW.

First Order.—Cows of this Size and Order yield, during the hight of their flow, *eighteen litres* a day, and continue to give milk until they are eight months gone with calf.

They exhibit the same delicacy of texture, and the same yellowish color of the skin within the escutcheon, as those of the higher Orders of the foregoing Classes. The escutcheon, in its upper part, is broader than that of the Second Class. It commences between the four teats, and on the inner surface of the thighs above the hock joint. Rising thence, and encroaching upon the outer surface of the thighs to two points, (A A) about midway up, its upper part is bounded by the lines above mentioned; which, beginning at the points A A, curve outward, and are united, just below the vulva, about an inch or less from it, by another short curved line. (B) The lower part of the escutcheon is bounded by lines on the thighs, curving inward.

Above the hind teats, and nearly in a vertical line with them, are two ovals, (E E) formed by hair growing downward, the same as in the higher Orders of the two preceding Classes.

Second Order.—These Cows yield, during the hight of their flow, *sixteen litres* a day, and continue to give milk until they are seven months gone with calf.

The escutcheon is the same as that just described, only somewhat contracted in all its parts. There is but one oval (E) above the teats, on the left side. On the left of the vulva, is a streak of ascending hair, (F) about an inch and a half long by less than half an inch in width.

Third Order.—These Cows yield, while at the hight of their flow, *fourteen litres* a day, and continue to give milk until six months gone with calf.

The escutcheon is of the same shape as in the preceding Order; contracted, however, in all its parts. The point B is still lower down. To the right and left of the vulva are two streaks of ascending hair, (F F) about four inches long by less than an inch in width. Above the teats, on the left, is one oval (E).

Fourth Order.—These Cows, while at the hight of their flow, yield *twelve litres* a day, and continue to give milk until they are four months gone with calf.

The escutcheon is still the same in shape, but on a yet smaller scale throughout; its upper extremity at a greater distance, therefore, below the vulva. The base of its upper part rests on the udder. The streaks of ascending hair, (F F) on the right and left of the vulva, are longer and wider than those in the third Order; and the hairs within them bristle up, projecting on each side. On the right there is a failure of the ascending hair below the point A, and its place (F) is occupied by hair growing downward.

Fifth Order.—These Cows, while at the hight of their flow, yield *ten litres* a day, and continue to give milk until they are three months gone with calf.

The escutcheon is smaller still, lower down, and confined to the inner surface of the thighs. On the left, there is a patch of bristling hair growing upward, nearly eight inches long by an inch and a half, or more, in width. To the right and left, beginning at the points A A, are two spaces (F F) covered with hair growing downward instead of the ascending hair. They are about four inches in width, and six inches long, running inward toward the crease formed by the meeting of the thighs.

SIXTH ORDER.—These Cows, while at the hight of their flow, yield *seven litres* a day, and continue to give milk until they are two months gone with calf.

The escutcheon is still of the same shape; but the point B is now so far down below the vulva that it must be looked for where the thighs meet. At the point E, under the vulva, is a small patch of ascending hair, about an inch and two-thirds long, by four-fifths of an inch in width.

SEVENTH ORDER.—These Cows, during the hight of their flow, yield *five litres* a day, and continue to give milk until they are impregnated anew.

The escutcheon is yet more reduced in size, and is now hid away between the thighs. To the right and left of the vulva, are two patches of ascending hair, (F F) which bristles up and projects on each side. They are about six inches long by two and a half wide.

EIGHTH ORDER.—These Cows yield, while at the hight of their flow, *three litres* a day, and go dry upon being got with calf.

In this Order, the escutcheon is still perceptible, but it is of a very diminutive size.

COW OF MEDIUM HIGHT.

FIRST ORDER.—These Cows yield, while at the hight of their flow, *fifteen litres* a day, and continue to give milk until they are eight months gone with calf.

SECOND ORDER.—These Cows yield *thirteen litres* a day, and continue to give milk until they are seven months gone with calf.

THIRD ORDER.—These Cows yield *eleven litres* a day, and continue to give milk until six months gone with calf.

FOURTH ORDER.—These Cows yield *nine litres* a day, and continue to give milk until five months gone with calf.

FIFTH ORDER.—These Cows yield *seven litres* a day, and continue to give milk until four months gone with calf.

SIXTH ORDER.—These Cows yield *five and a half litres* a day, and continue to give milk until three months gone with calf.

SEVENTH ORDER.—These Cows yield *three and a half litres* a day, and continue to give milk until two months gone with calf.

EIGHTH ORDER.—These Cows yield *two litres* a day, and go dry upon being got with calf.

LOW COW.

FIRST ORDER.—Cows of this Order and Size yield, while at the hight of their flow, *twelve litres* a day, and continue to give milk until they are eight months gone with calf.

SECOND ORDER.—These Cows yield *ten litres* a day, and continue to give milk until seven months gone with calf.

THIRD ORDER.—These Cows yield *eight litres* a day, and continue to give milk until six months gone with calf.

FOURTH ORDER.—These Cows yield *six litres* a day, and continue to give milk until five months gone with calf.

FIFTH ORDER.—These Cows yield *five litres* a day, and continue to give milk until four months gone with calf.

SIXTH ORDER.—These Cows yield *four litres* a day, and continue to give milk until three months gone with calf.

SEVENTH ORDER.—These Cows yield *three litres* a day, and go dry upon being impregnated anew.

EIGHTH ORDER.—These Cows yield *two litres* a day, and go dry upon being impregnated anew.

BASTARD OF THE CURVELINE COW.

In the Curveline Cow, the growths of ascending hair, (F F) to the right and left of the vulva, require special attention, in regard to their dimensions, to see that they are of the size indicated in the several descriptions of the different Orders. When they are of small size, they do not indicate a very rapid loss of milk; but when they are from four to five inches long, by an inch and a half in width, (in which case they are generally pointed at both ends, and consist of coarse hair,) they may then be considered as the size of a *bastard* Cow, that will go dry so soon as she is got with calf. As a general rule with regard to these marks, the larger they are, the worse will the Cow be in this respect. (See Plate IX. Fig. 4.)

CLASS IV.

The Bicorn Cow.

This name is given to my Fourth Class, because the upper part of its escutcheon represents two horns. Cows of this class are good milkers. They are found in all the breeds which we possess in France. In this, as in the other Classes, the general mark of the Class presents itself under modifications indicative of the Order to which the Cow belongs.

HIGH COW.

FIRST ORDER.—Cows of this Order and Size yield, while at the hight of their flow, *sixteen litres* a day, and continue to give milk until they are eight months gone with calf.

Like those of the same Order in the foregoing Classes, they are distinguished by the delicacy of their udder. The dandruf which detaches from the skin throughout the escutcheon is of a yellowish or copperish color. This escutcheon, as I have said above, has at top two horns, formed in the way that is seen in the drawing. (Plate IV. Order 1.) It begins, as in the foregoing Orders, in the space between the four teats, and on the inner surface of the thighs, just above the hock joint; whence it rises toward the tail, spreading over the inner surface, and partially over the outer surface, of the thighs, to the points A A. From these points, its outline consists of curved lines to the points B B, which are distant about four inches from the vulva. Thence the outline descends again on each side in nearly straight lines, which meet at the point C, immediately beneath the vulva, and at the distance of about eight inches from it. On the right and left of the vulva, are two streaks of ascending hair, (F F) about two inches long by two-fifths of an inch in width.

As in the higher Orders of the Classes already described, so in the present we find, above the two hind teats, two small oval marks, (D D) formed by hair growing downward in the field of ascending hair.

SECOND ORDER.—These Cows, while at the hight of their flow, yield *fourteen litres* a day, and continue to give milk until they are seven months gone with calf.

The escutcheon is the same as in the First Order; except that it is on a smaller scale, and does not reach so high up. The color of the skin within it is the same. Of the two streaks of ascending hair, (F F) on the right and left of the vulva, the one on the left is of the same size as in the First Order, whilst the other is but half as long. Of the two horns, (B B) the one on the right is upward of an inch shorter than the other. There is but one oval mark (D) above the teats, on the left.

Third Order.—These Cows, while at the hight of their flow, yield *twelve litres* a day, and continue to give milk until six months gone with calf.

The escutcheon is of the same shape as in the preceding Order; smaller, and consequently spreading less upon the outer surface of the thighs; the right hand horn shorter, by about two inches, than the one on the left. There is but one of the marks (F) along side of the vulva, on the left.

Fourth Order.—These Cows, while at the hight of their flow, yield *ten litres* a day, and continue to give milk until five months gone with calf.

The escutcheon is smaller than in the Third Order; but the same in shape, except on the right of its lower part, when the following irregularity occurs: below the point A, the ascending hair is encroached upon by a growth of descending hair, that runs into the escutcheon, forming an angle, the point of which is at I I. Measured across from the point A, this angle of descending hair penetrates the escutcheon to the distance of about four inches; whilst the break which it makes in the outline of the escutcheon is from six to seven and a half inches long.

Besides this irregularity in the shape of the escutcheon, this Order is distinguished by a streak of ascending hair (E) under the vulva, nearly three inches long by two-fifths of an inch in width.

Whenever the blemish or irregularity in the escutcheon here described is found, it indicates a more rapid decrease in the daily yield of milk than would be exhibited by a Cow possessing the same escutcheon free from blemish; and the rate of decrease will be proportionate to the size of the blemish; that is to say, to the extent of surface covered by the descending hair where it encroaches upon the field of upward growing hair.

Fifth Order.—These Cows, while at the hight of their flow, yield *eight litres* a day, and continue to give milk until they are four months gone with calf.

The escutcheon the same in shape as the preceding, but on a smaller scale. Near the vulva, to the left, is a streak of bristling hair, growing upward, (F) about six inches long by two wide. At the points A A, on the right and left, are two spaces where the ascending hair fails and is replaced by downward growing hair; which spaces penetrate the inner surface of the thighs to the points I I.

Sixth Order.—These Cows yield, during the hight of their flow, *six litres* a day, and continue to give milk until three months gone with calf.

The escutcheon the same as in the Fifth Order; but smaller, and hid away between the thighs. Above it, to the right and left of the vulva, are two streaks (F F) of ascending hair, bristling up and projecting sideways. They are of the same size as the one in the preceding Order, just described.

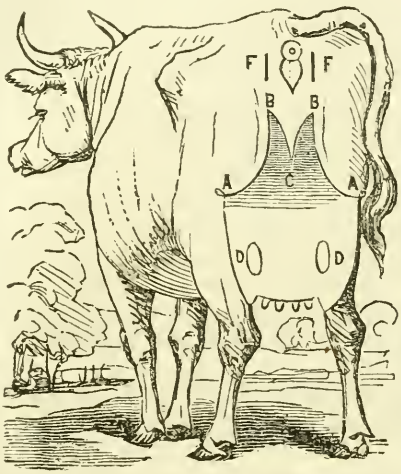
Seventh Order.—These Cows yield, whilst at the hight of their flow, *four litres* a day, and continue to give milk until they are two months gone with calf.

The same escutcheon, but still more hid away between the thighs. The marks on the right and left of the vulva, consisting each of a growth of bristling

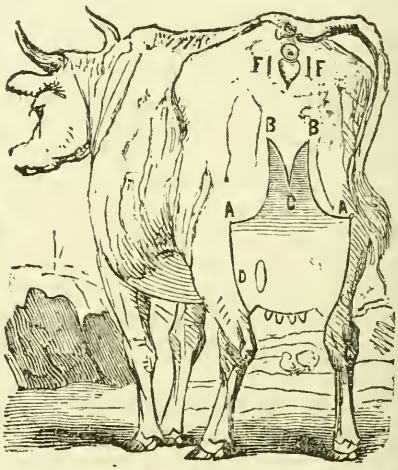
Table IV.....Class 4.

THE BICORN COW.

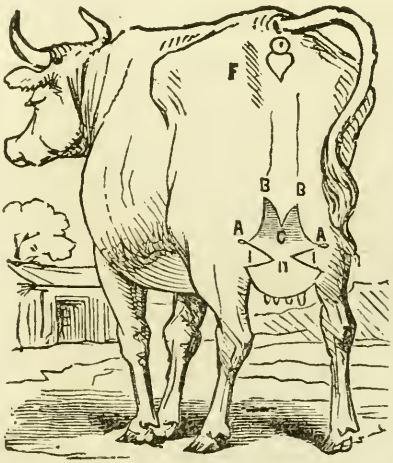
Order 1st.



Order 2d.



Order 5th.



Order 6th.

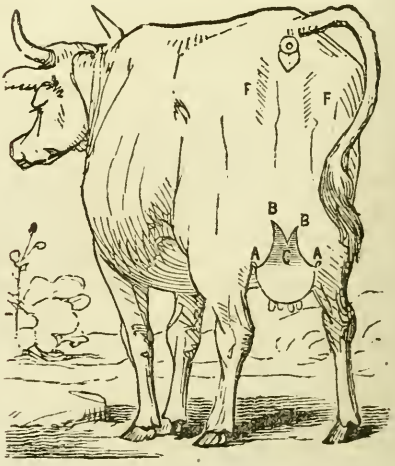
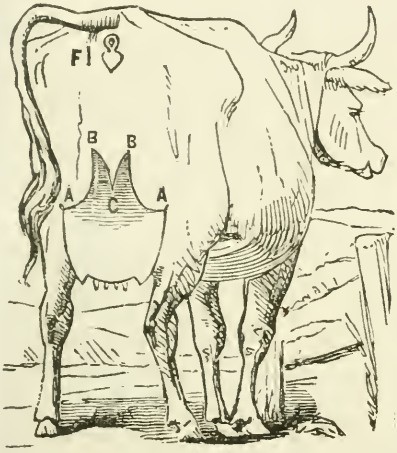


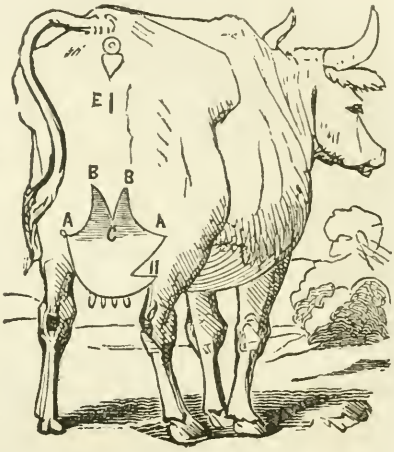
Table Ib.....Class 4.

THE BICORN COW.

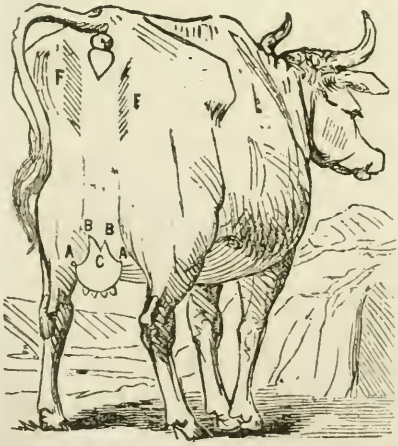
Order 3d.



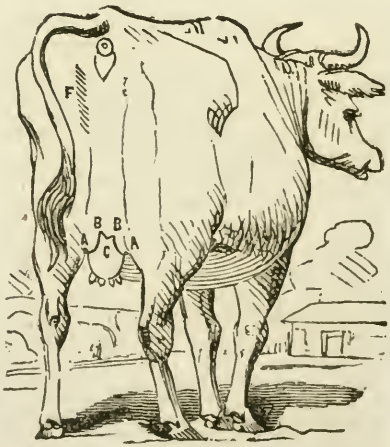
Order 4th.



Order 7th.



Order 8th.



QUAKER, OR FRIENDS' FARMING.

[We hope no offence will be taken at the use of the term *Quaker*—it is associated with early and respectful recollections.]

THE question of *thick or thin sowing* of grain has been much agitated and for a long time, (among agriculturists, but more so recently, in England.) Doubtless this dispute has been prolonged, as all others are, by inattention to difference of circumstances—such as quality of land, time of sowing, variety of seasons, &c. But what proposition so clear as not to admit of dispute?

The following statement, founded on actual experiment, as others have been attended with different results, has, for us, the particular recommendation to that confidence which we must confess we are inclined to repose in all experiments and statements of this sort *made by Quakers, or "members of the Society of Friends,"* over all opposing statements—other things being alike! They deny themselves recreation and amusement and self-indulgences, which other people derive from so many sources to which they have no recourse, or positively eschew; that what they do give their minds to they are apt to perform with earnestness, vigilance and exactness. What they eat is clean, what they wear is choice of its kind, and what they do is *well done.* We once knew a Quaker fox-hunter, and he kept the best dogs, and nothing but a good *brook* could stop him. With them nothing is wasted, not even *breath*; they won't speak until the spirit moves, and the best of it is, *they know when to stop.* Pity but we could have a Quaker Congress, but if all were Quakers, a session once in seven years would be quite often enough. Like a mule in mountain-path, they always mind how they step; when you *can* get them to write about Agriculture, what they say *tells.* We wish the spirit would move them to write for the FARMERS' LIBRARY. Hear what an English one says about

EXPERIMENTS ON THICK AND THIN SOWING.—ON THE BEST METHOD OF FEEDING SHEEP.—ON THE POTATO CROP.

To the Editor of the Mark-Lane Express:

SIR: Believing it to be the duty of every man to contribute to the common stock of information whatever his experience may have placed in his power deemed to be of importance, or his position in society has enabled him to collect from the experience of others, I request the insertion in your useful paper, of the following articles on subjects of stirring import at this time, hoping they may be received by your readers in the same spirit and feeling as they have been communicated to, and are now contributed by me, and then, I am sure, great good will result every way.

The subjects which I propose bringing under the notice of your readers are:

Experiments on thick and thin sowing, by broadcast, drilling, and dibbling.

On the best method of feeding the largest number of sheep in the shortest time, and at the least expense, taking into the account the value of the manure, and of the succeeding cereal crops.

On the potato crop; the causes of failure to so large an extent in the present year, with suggestions toward preventing a recurrence of the evil.

EXPERIMENTS ON THICK AND THIN SOWING.

Communicated by a member of the Society of Friends, residing in Essex:

"I remember that last year thou took an interest in some experiments I made to ascertain the produce of wheat from different quantities of seed. I believe I told thee that I intended to pursue the matter a little farther: I have done so; and now enclose thee a statement of the result, thinking thou mayest wish to see it. I was quite convinced, from the issue of last year's trial, that the smaller quantity of seed then used (viz., four pecks per acre) was insufficient, and therefore did not try that quantity again, but limited myself to a comparison of the produce between six, seven, and eight pecks of seed per acre. A perusal of the accompanying statement will show a similar result to that of last year, viz., that the greater quantity of seed produced the largest amount of corn, and that the produce decreased in a larger proportion as the quantity of seed was lessened. Thus:

	qrs.	bu.	pks.	qts.
No. III. Having eight pecks of seed to the acre, produced	2	2	3	5¾
No. IV. Having seven pecks of seed to the acre, produced	2	2	1	5½
Difference	0	0	2	0¼
Equal to 1 bush. per acre.				
No. IV. Having seven pecks of seed to the acre, produced	2	2	1	5½
No. V. Having six pecks of seed to the acre, produced	2	1	2	0¾
Difference	0	0	3	4¾
Equal to 1 bush. 3 pks. 1½ qt. per acre.				

"I consider the autumn of 1844 was a very favorable one for the planting of wheat. I might say unusually so for the description of heavy stiff land which I farm; and, therefore, the trial was made under circumstances propitious to a small quantity of seed; and I, accordingly, sowed less by one peck per acre than I generally do: the working out of the above results is, therefore, such as satisfies me that less than eight pecks should not be sown. I, however, by no means intend to say that a greater quantity may not often be beneficial; I have long entertained the opinion that different soils and different seasons require a difference in the quantity of seed. I think to follow this matter no farther, but will just add that, having just before harvest had an opportunity of looking over the crops of J. J. Mechi, who, perhaps thou art aware, has obtained some notoriety by his agricultural projects at Tiptree Hall, I there saw specimens of thin sowing, viz, four pecks to the acre, side by side with eight pecks to the acre. A large party of agriculturists who were present were unanimous

in estimating the thin sown as far below that which had a more liberal quantity of seed.

"From the accompanying paper thou wilt see that I took the opportunity also of making a comparison between the produce of wheat sown by hand or broadcast, and that sown by the drill; the quantities of land as well as of seed being equal, the result shows in favor of the former as compared with drilling in rows six inches apart, but against it as compared with drilling in rows nine inches apart. The difference of produce between Nos. 2 and 3 has surprised me, having previously held an opinion that the plants could not be too equally distributed over the surface; and, therefore, that smaller intervals between the rows was best. With the view of trying if this was occasioned by any accidental circumstances, I propose to repeat the experiments of Nos. 1, 2, and 3.

"If thou thinkest the statement at all likely to interest any of thy friends, I wish thee to use thy liberty in showing it.

"Account of Produce from equal Quantities of Land (about half an acre) sown with different Quantities of Wheat, or in different Manners.

	qrs.	bu.	pks.	qts.
No. I. Sown broadcast, at the rate of eight pecks per acre.				
Wheat, best	2	1	2	7
do. tail	0	0	2	5
Total	2	2	1	4
No. II. Drilled in rows, six inches apart, at eight pecks per acre.				
Wheat, best	2	1	2	0½
do. tail	0	0	2	4¾
Total	2	2	0	5
No. III. Drilled in rows nine inches apart, at eight pecks per acre.				
Wheat, best	2	2	0	7¼
do. tail	0	0	2	6½
Total	2	2	3	5¾
No. 4. Drilled in rows nine inches apart, at seven pecks per acre.				
Wheat, best	2	1	3	0¼
do. tail	0	0	2	5¼
Total	2	2	1	5½
No. V. Drilled in rows nine inches apart, at six pecks per acre.				
Wheat, best	2	0	2	4¼
do. tail	0	0	3	4½
Total	2	1	2	0¾

"N. B.—The comparison between Nos. I. and II. is in favor of broadcast sowing over the narrow drilling. Between I. and II. is in favor of wide drilling over the broadcast.

II. and III. is in favor of that drilled at greater distance.

III. IV. and V. is in favor of the greatest quantity of seed.

"That dibbling should be preferable to drilling experience has long shown, could the difficulty be overcome of irregularity in the quantity of grains deposited; whoever shall discover an instrument that will produce that regularity will be a benefactor to his country, and would no doubt be well rewarded by the Royal Agricultural Society, as at least two pecks per acre of seed might be saved with benefit to the crop."

ON THE BEST METHOD OF FEEDING SHEEP.

Communicated by a first-rate farmer resident in Buckinghamshire:

"I last year folded 400 sheep upon turnips, part Swedes, part Norfolks, and part Tancrede, the crop averaging about 20 tons per acre. To each sheep I gave daily half a pint of tick (horse) beans and half a pound of oil-cake (English). The sheep did well. I never lost so few before. The binding quality of the beans seemed to be neutralized by the aperient quality of the cake. The sheep got fat surprisingly fast, and the return greater than I had ever before experienced. I sowed the same land this year with barley, and although a thin, rather hungry soil, my crop averages six quarters (48 bushels) per acre of prime quality. The land is what is considered 18s. per acre land,* incapable of any other improvement than is attainable by manure and judicious cropping. On the same land in former courses, giving the sheep corn only, I sometimes lost from two to four in a score. The manure from the keep was comparatively poor, and the succeeding crop of barley seldom exceeded three quarters and a half to the acre; my sheep being also of less value by several shillings a head than they are this year, after allowing for the difference in prices now and last year. In both cases my expenses were nearly the same."

ON THE POTATO CROP.

Having for several years had the management of a considerable number of field-gardens in this parish, let to the laboring classes, and Potatoes being cultivated in this and the adjoining parishes extensively for sale, my attention has been drawn to the mode of growing and preserving them for use in the winter season, and lately, more especially so, from the unusual degree of injury which the crop has suffered from the cold, wet weather experienced at the early part of the season, and the extreme cold of the last week of July and early part of August; to which circumstances alone I attribute the present defective state of the crop of some kinds of Potatoes, that is, the older kinds, as Goldfinders, Shaws, Champions, and others; whilst the seedling kinds have, comparatively, received but little injury.

It is, I conceive, with Potatoes as with some of the fruits, such as the golden pippin, styer, &c., and the breeding in and in of animals, as well of the two-legged as of the four-legged kinds; that each succeeding generation becomes weaker and weaker, and are more subject to disease than those resulting from good seed and good crosses. The crops, and fruits, and animals have stronger constitutions, and are capable of resisting attacks of disease which poverty of blood from the causes referred to never fails to engender: *hence every encouragement should be given to the raising of Potatoes from seed*, rather than from worn-out tubers; and hence I am of opinion, that the Royal Agricultural [*and all America*] Society would do well to offer premiums for the *best seedling* Potatoes [and fruits, as we have before urged] to be exhibited at their country shows in succeeding years.

The proximate cause of the disease this year was, I conceive, the pulpy state of the tubers and of the haulm, caused by the wet season and the cold, bordering upon, if not actual frost, at the end of July. By checking the free flow of the sap juices to the tubers, the haulm became black, and died away; and the tubers, having been deprived of their necessary food to ensure the requisite degree of perfection, became subject to disease; and in proportion as the constitutional strength prevailed, in a greater or less degree was the degree of destruction that ensued.

Various modes have been suggested for the preservation of what remains: the housing of the tolerably sound ones as dry as possible, and sprinkling them over with plaster of paris (gypsum), in the proportion of half a peck to a sack of Potatoes, placed in layers, is the safest way. The gypsum absorbs the ammonia of the diseased parts, improves the atmosphere around the Potatoes, and hence prevents the possibility of fever among those engaged in sorting and occasionally turning of them, which should not be neglected whilst the weather continues open.—

* This means land worth $4 50 rental per acre.

There is this farther advantage, that, if the gypsum so used be strewed over the sets before planting next year, it will stop their weeping, and materially aid in producing a more abundant crop. I know that to be so, from experience; my own crops last year having been so managed were abundant, and of excellent quality.

It is desirable also that larger quantities should not be purchased at any one time by the wealthy than will serve their respective families for a month or so; there would then be a supply for the poor always in the market, at moderate prices. Nor should societies buy up largely to give away: it is always better to risk an increase of price rather than, by buying largely, produce the evil which such large purchases are intended to prevent. The securing of Potatoes to plant in the ensuing year is another point of great importance to be attended to. Seedling Potatoes should, if possible, be procured, and the land that has been planted this year should, on no account, be planted with Potatoes in the next year; but, whatever crops may be planted upon that land, gypsum should form a considerable item in the compost or manure.

JAMES DEAN.

Tottenham, Nov. 8.

[The originals, of which the above are copies, were laid before the Council of the Royal Agricultural Society of England on Wednesday, Nov. 5.]

QUAKERS, *or Friends*—originally called Seekers, from their seeking the Truth; and afterward Friends—a beautiful appellation and characteristic of the relation which man, under the Christian dispensation, ought to bear toward man. Justice Bennet, of Derby, gave the Society the name of Quakers in 1650, because Fox (the founder) admonished him and those present with him to tremble at the name of the Lord. This respectable sect, excelling in morals, prudence and industry, was commenced in England about A. D. 1650, by George Fox, who was soon joined by a number of learned, ingenious and pious men—among others by George Keith, William Penn, and Robert Barclay, of Wry.* The *thee* and *thou* used by the Quakers, originated with their founder, who published a book of instructions for teachers and professors. The first Meeting-house, in London, was in White Hart-Court, Grace Church-st. The first meeting of Quakers in Ireland was in Dublin, 1658, and their first Meeting-house in that city was opened in Eustace-st. 1692. The solemn affirmation of Quakers was enacted to be taken in all cases, in the courts below wherein oaths are required from all other subjects, 8 William III. 1696. This affirmation was altered in 1702 and again in 1721. Quakers were relieved from oaths qualifying persons to municipal offices, 9 George IV. 1828; more expressly relieved by statute 1 Victoria, 1837. This last act was extended to persons who, having been formerly Quakers or Moravians, had seceded therefrom, yet had retained certain opinions as to oaths, 2 Victoria, 1838.

* The Quakers early suffered grievous persecutions in England and America. At Boston, where the first Friends who arrived were females, they, even females, were cruelly scourged, and their ears cut off; yet they were unshaken in their constancy. In 1659 they stated in Parliament that 2000 Friends had suffered persecution and imprisonment in Newgate; and 164 Friends offered themselves at this time by name to Government to be imprisoned in lieu of an equal number in danger (from confinement) of death. 55 out of 120 sentenced were transported to America by an order of Council, 1664. The masters of vessels refusing to carry them, for some months an embargo was laid on West India ships, when a mercenary wretch was at length found for the service.—But the Friends would not walk on board, nor would the sailors hoist them into the vessel, and soldiers from the Tower were employed. In 1665 the vessel sailed, but it was immediately captured by the Dutch, who liberated 28 of the prisoners in Holland, the rest having died of the plague in that year.

SUGAR CULTURE IN TEXAS.

BRAZORIA CO. TEXAS, Nov. 27, 1845.

To the Editor of the N. O. Com. Bulletin:

Dear Sir: The following paragraph in Judge Rost's Oration before the "Agricultural and Mechanics' Association of Louisiana," was published in your valuable journal on the first of this month. You will oblige many of your friends here by re-publishing his remarks on the culture of Sugar in Texas, together with the remarks which I subjoin.

"A person looking upon the map of America," (says Judge Rost.) "and perceiving a large portion of Texas south of Louisiana, would naturally suppose that Texas is the better sugar region of the two. But the Louisianian who travels in mid-winter through prairies of that naked land, exposed to the unmitigated fury of north-westers, soon discovers that he has changed climate indeed, but that he has not come to regions in which tropical plants love to grow. I have it from a gentleman of undoubted veracity, Mr. John C. Marsh, that he has planted cane five successive years in the neighborhood of Galveston, and that he has never obtained rattoons from it. You may then consider it as a well-authenticated fact, that in Texas, as far south as New-Orleans, cane will not rattoon; the cold in winter destroys the stubble. I do not mean to say that it may not to some extent be cultivated there; but I assert that the competition will be by no means a dangerous one, and that upon trial it will be found that the Red River parishes of this State are better adapted to that cultivation than the greater part of what has been called the sugar region of Texas.

"Louisiana must remain the great sugar region of the United States; her climate and her soil are the best, and her geographical position is unrivaled. Reflect, sir, that almost every hogshead of Sugar made here is shipped without land carriage; that planters can always obtain from New-Orleans in two or three days any machinery they want, and that their supplies and their market are both brought to their own door. Compare this situation with that of the Texas planter, and you will admit that there is no room for apprehension."

My only object in replying to this article is to correct the erroneous impression which it has or may propagate with persons at a distance who feel an interest in the production of Sugar, and who may be led to believe, that because Mr. Marsh has failed to produce rattoons on the barren lands in "the neighborhood of Galveston," all Texas is involved in the same category.

Eli Mercer, on the Colorado River, in latitude 30, has planted cane successfully for seven years. Last year he produced 63 hhds. of superior Sugar, with but 6 hands, from rattoons *six years old*, and believes it will produce well three to four years longer. His planting is on mulatto-colored cane land.

John Sweeney, on the Bernard River, in latitude 29½, produced last year, with 28 hands, 182 bales of cotton, averaging 500 lbs. and 74 hhds. of superior Sugar, with a rude wooden mill to grind his cane, which is supposed to have ex-

tracted but little more than half the juice. This year's crop is from rattoons five years old. His production of both cotton and Sugar this year will exceed the last. He plants black peach land.

Capt. Duncan, on Caney Creek, and James P. Caldwell, on the Brazos River, have also been eminently successful in planting cane, *and in no instance have the rattoons been lost by the frost.* Last year there was not frost enough to kill the vegetables in our garden, and this fall we have been entirely free of frost till the 20th of this month (November.)

The experience derived by planting cane here seven years, proves that it matures earlier, and the mildness of our fall season gives us longer time to grind than the Louisiana planter usually enjoys. As to our lands, no difference of opinion exists with those who see them; their quality is unrivaled, and large bodies may be had, not subject to overflow, nor *requiring the least expense to drain them*, at from $3 to $8 per acre; 1000 acres in Louisiana, of less real value, would cost probably $50,000, a sum that would buy the Texas planter not only this quantity of land, but also from 70 to 80 hands to work it. An item in interest is thus saved, amounting to $4000 annually. I have no positive data to prove the difference of transporting our sugar to the northern cities, compared with freights from New-Orleans to same ports. There has been but little competition in the commerce of Galveston, yet the freight on uncompressed cotton for three years, has been but ¾ cent per maximum, and ⅝ cent minimum to New-York; and I deem it fair to say that with the competition that will naturally arise, and the ease with which Galveston can be approached from the Gulf, compared with New-Orleans, with the great saving to vessels in not being compelled to pay high port charges and steaming up the Mississippi River, will keep our freights as low as they will be from New-Orleans. There is another important advantage which the Texas will ever possess over the Louisiana planter: it is in obtaining his beef from his ever fat herds of cattle, and pork, corn and potatoes from his farm, at an inconsiderable expense.

I have deemed it necessary to say this much in reply to the article of Judge Rost, which, from false data, does us great injustice. Nothing can be farther from my intention than to derogate from the many advantages which your gallant State possesses for the culture of Sugar. With the Judge, I fully believe that she has nothing to fear from our competition; for, with reasonable protection, to give us the vastly increasing market of now 20,000,000 of consumers, with a margin for near 200,000 hhds. now filled by foreign importation, we can both march on, hand in hand, identified in our interests, and only rivaling each other in a vain attempt to supply the increasing demand for the richest agricultural product of the earth. COLUMBIA.

FLOODING MEADOWS.

In answer, for the present, to a correspondent, we believe in Connecticut or Vermont, whose letter we have mislaid, we give the following from the Farmer's Magazine:

PRACTICE OF IRRIGATION.

The first operation on the intended meadow is, to free it thoroughly of water by draining. If springs exist, they should be cut off by drains of sufficient depth to reach the source of injury. But, in addition to this, the land, if the soil is clayey, or rests upon a tenacious subsoil, should be effectually furrow-drained, so as to afford a ready egress to the water underground. The land is then to be leveled and otherwise prepared. If it is already in old turf, it will be well to pare off the sward with the spade, and after having dug and prepared the ground, to replace the turf. In this manner the meadow will be ready for the reception of the water, as soon as it is formed. But should there be no turf upon the ground, or should this turf be filled with useless or innutritious plants, the land should be thoroughly worked, leveled, and otherwise prepared, and then sown with the suitable grass-seeds. These grass-seeds may be sown in autumn. We cannot, however, in this case, admit the water during the first winter. We must retain the land in pasture for the whole of the following winter and summer, so that the young plants may establish themselves in the soil. But in the second winter we may generally admit the water. The ground may be in part prepared by the plow, and we may even economize expenditure by taking a crop of some kind before we begin to level and otherwise from the meadow; but generally it is better to proceed at once with the formation of the meadow, and employ the spade in place of the plow for leveling and preparing the ground for the reception of the grass-seeds in autumn. Along the higher side of the meadow is first to be formed the main conductor, to which the water is carried, and from which it is conveyed over the surface of the meadow. The earth taken out of this trench is to be employed in banking it, and filling up hollows in the surface of the ground. The size of the main conductor must be proportioned to that of the meadow, and the quantity of water to be conveyed.

The next operation is, forming the main drain, at the lower part of the land to be flooded. It is of the same size as the main conductor, and the earth taken out of it is to be employed in banking or filling up hollows. The surface of the meadow, supposing it to be flat, is now to be formed into beds or planes, from 30 to 40 feet in width, extending from the main conductor to the main drain. These beds may be elevated about 12 inches at the center; they are not curved like the ridges of a plowed field, but form incline planes from the center to each side. At leaving the main conductor they may be 20 inches wide, gradually narrowing to nearly a point at their termination when they reach the surface. If stops of solid earth are left, these may be 6 inches either way, with their diagonal in the line of the feeder, and such of them as are not required may be afterward removed. The earth taken out of these feeders is to be employed in making good their own banks, and in leveling the inequalities of the surface. Corresponding with the feeders, and alternating with them, are

to be formed the series of subordinate drains, communicating with the main drain. They are of the same dimensions as the feeders, with this distinction, that they are widest and deepest where they communicate with the main drain, and become gradually smaller to the upper part of the meadow, where they terminate. The surface of the meadow being formed, the grass-seeds, where no turf has been reserved, are to be sown. The following admixture of grasses will be found suitable:—1. Alopecurus pratensis—meadow foxtail; 2. Phleum pratense—meadow cat's-tail; 3. Agrostis alba—marsh bent grass; 4. Poa trivialis—rough-stalked meadow-grass; 5. Poa pratensis—smooth-stalked meadow-grass; 6. Festuca loliacea—spiked fescue grass; 7. Festuca pratensis—meadow fescue. When the old turf has been replaced, the water, it has been said, may be admitted in the first winter; when grass-seeds have been sown, the water cannot be admitted until the second winter, and sometimes even not until the third. The ground should be depastured with sheep during the first summer to such a degree as to prevent the plants from putting forth their flowering stems and producing seeds.

The next point to be considered is the management of the meadow when completed. At the beginning of October, we are to prepare for admitting the water. To this end the drains and feeders are to be cleaned out, and the banks where injured repaired. The main sluice is then to be withdrawn, when the conductors and feeders will be gradually filled. The next point is to adjust the water in the several feeders. To this end the workman is to observe that each feeder, beginning with the first in order, receives a due quantity of water. If not, he enlarges the mouth so as to allow the proper quantity to enter. He then adjusts the tops in the several feeders, so that the whole surface of the beds shall be covered equally about an inch deep with water. During this and the three following months—namely, November, December, and January—the ground is to be regularly flooded for 15 or 20 days at a time, with intermissions at each time of seven of eight days, during which the ground is to be laid perfectly dry. Farther, when severe frost is threatened, the water is in like manner to be withdrawn, so as that it may not freeze upon the surface. During this, the principal periods of flooding, the meadow is to be inspected every three or four days, to see that no interruption from the breaking of banks, accumulation of weeds, or otherwise, is given to the flowing of the water. When the spring months arrive, and grasses begin to grow, the periods of flooding are to be shortened. In the month of February the water should never be allowed to flow above six or seven days at a time, and in severe frosts it should be withdrawn, so that no ice may be formed upon the meadow. The same management, shortening from five to six days the periods of flooding, may be continued till the middle of March, by which time the meadow will be ready for receiving any kind of stock. In this manner an early supply of herbage is obtained; and after the stock has been removed, as by the beginning of May, the flooding may be resumed and continued till near the end of the month, so as to prepare the meadow for hay. But often this spring feeding is not resorted to. The irrigation is continued during the months of March, April, and until the middle of May, when it finally ceases. But during this period, the frequency and length of time of watering are gradually diminished from five or six days in March, to two or three in the latter period of flooding. Caution is required in flooding as the season advances; because, were the finer grasses to be too long submerged at this period of growth, they would be injured and destroyed. The actual periods of flooding differ with the state of the season and the nature of the soil. A practical rule adopted for irrigation is, never to continue to flood when a white scum is seen to form on the surface of the water, for this indicates that the putrefactive fermentation has commenced in the turf. By the middle of May, or rarely later, the flooding is to cease, and the land to be laid thoroughly dry. The grasses will now grow with great luxuriance, and produce an abundant crop of hay. When the hay is removed, the aftermath is depastured, after which the same process of flooding recommences. Sometimes, after the hay is removed, the ground is again flooded; but in this case, no sheep must be admitted on the flooded land, or, if admitted, they must be such sheep as are to be immediately killed; for this summer flooding never fails to bring with it the disease of rot in its most destructive form. In place of the meadow being applied to the production of hay, it may be applied to the production of green forage for soiling. This is a more profitable mode of applying the watered meadow than for the production of hay. Three crops, in this case, may be taken, the meadow being flooded after each crop is removed. [Professor Low on Landed Property.

COST OF SHEEP KEEPING IN ILLINOIS.

BY A. CHURCHILL.

MESSRS. EDITORS: J. S. Skinner requests some of your correspondents to show, "by figures, at how low a price for wool, sheep-growing may be followed as a livelihood." It will be a hard task for any one person to answer the question for the whole State, or even for one county, as the facilities for keeping sheep vary with every individual who keeps them; and without collecting an amount of sheep and feed statistics, at present entirely beyond the reach of any one man, a correct answer cannot be given. But I will attempt to give him the result of my estimate where the summer range on native feed is extensive, and where native hay can be cut in abundance.

I shall estimate for a flock of 1000, allowing a shepherd continually with them during the day, and folds for the night.

Expense of shepherd, including board	$200
Two hundred tons of hay, cut and stacked	200
Interest on fixtures and incidentals	100
Total	$500

Thus it seems that according to my estimate, fifty cents per head would be the least at which they could be kept. The shepherd could not be dispensed with during summer, unless the wolves were destroyed and the pasture fenced and well set with English grass.

There is one flock of 1000, wintering in Du Page county, the cost of which will be about seventy cents per head. The flock arrived late, and the feed must be purchased a little here and a little there, which adds at least fifty per cent. to the cost of wintering.

Wool should not be less than twenty cents per pound to enable the wool-grower to make a "livelihood" of it in Northern Illinois.

To Mr. Crocker's queries I would say that after

ten years' experience in Northern Illinois, I have found that sheep live well on grass or on what they find on the prairies in the fall, even till snow comes, *provided* ALWAYS, *that they are not confined to the same piece of ground.*—Give them a new range every day, or give them English "grass or roots, or both combined."

Prairie may be well set with grass by sowing the seed in the spring, and pasturing close afterward It is better to harrow on sowing the seed. Or sow on wet ground. mow in June, and pasture close through the remainder of the season mow the next year in June, and pasture as before. The third mowing will be principally English grass, especially if timothy and red top are saved in equal quantities. Or you may, if the season is wet, burn a piece of prairie on which a good coat of old grass remains in June. Sow on plenty of seed, harrow well with a sharp harrow, feed close through the summer, and the next season the tame grass will be found very well set. If the weeds and wild grass are likely to overrun it, mow it in June, and your stock will keep the wild stuff down and allow the tame grass to get a good hold. If for pasture, blue-grass should be mixed with other seed.

If I had a large flock of Sheep and my range was limited, I should in June break a piece of prairie proportioned to my flock. The last of July I would sow turnips and grass seed on the sod, harrow with a light, sharp harrow feed off the turnips in the fall, and expect a good crop of hay the next year. And so I would proceed until I had sufficient land stocked with tame grass. [Prairie Farmer.

Avon, Kane Co. 1845.

☞ Sheep raising on these terms, requiring so much plowing and sowing of seed, and reaping, and turnip culture, could hardly compete, one would think, with sheep husbandry in Georgia, and Mississippi, and Louisiana, and Texas, where, *it is said,* they will live and do well through the whole year, without such expensive preparation and provision of food. By the bye, we consider it a sort of duty to make known that on trial, by a gentleman of experience, who was induced to embark in sheep husbandry, in the neighborhood of Asheville in North Carolina, that country does not, by any means, possess the advantages it was supposed to do for that object. [*Ed. Farm. Lib.*

THE SHEPHERD'S DOG.

WITH SKETCHES AND ANECDOTES.

Extract of a letter from G. W. LAFAYETTE—Chavaniac,* Nov. 5, 1845—to the Editor of the FARMERS' LIBRARY:

"I am here in a place very dear to me—the house in which my father was born. I will remain until December, the time at which I will have to attend the Chamber of Deputies in Paris.

"You must not think I have forgotten the Dogs. To send useful animals so far, it is necessary to choose them with discernment. I hope to be able to send you two dogs from Brie, well broken; the one to remain near the shepherd, the other on the outside of the flock. I will send you, also, two dogs from Auvergne, equal to those of the Alps or Pyrenees. You will receive, at the same time, instructions as to the employment of each."

* CHAVANIAC—the birth-place of General LAFAYETTE, inherited by GEORGE W. LAFAYETTE from his Aunt, MADAME DE LUSIGNAC. The Shepherd's Dog of Brie is about as large as a medium-sized Setter—with long, rough, wiry hair, generally, though not always, black; bright, intelligent, but rather wild-looking eyes; in form loose and gangling, for action and endurance incomparable. With different and suitable training, he is also of great use to the *drover.*

In the mountainous parts of France, the *wolves* are frequently forced by the snows into the valleys and plains, where from their size and voracity, they become exceedingly dangerous to both man and beast—not unfrequently destroying both, in the very midst of the villages. In these regions, the flocks are protected by large mastiffs—dogs of the largest size, of great intelligence, and of magnificent appearance—two of which are considered more than a match for any wolf. The breed exists in its greatest purity in the Pyrenees.

The disposition which exists to establish large sheep farms in the mountainous and other portions of the Southern States, so far south as not to require cultivated food in winter, can never be carried out successfully until some legislative provision is made against sheep-killing dogs, and until there shall exist a more general conviction of the indispensable services of Shepherd's Dogs, and provision be made for a more general supply of them, with the knowledge of the manner of raising and using them. It is with a view to all these objects that we wrote a friend on whom has descended, in all its force, his father's love of America, and it is with the same views that we shall endeavor to familiarize our readers with all the bearings of the subject. For shepherds, we are inclined to believe that, where they can be had, the Indians and Mexicans will make the best. There is in their nature and habits something pastoral, quiet and solitary, that serves to adapt them to the care of flocks. If the Alpacca is ever to be acclimated in this country, it must be in high, dry and warm regions, wherever they are to be found. We may be mistaken, but—*we shall see.*

The danger is, on the first introduction of Shepherd's Dogs, that their use may be abandoned in disappointment and disgust, from want of reflection on the part of the sheep-owner that the *sheep,* as well as the dog, will require to be *trained.* In our country no sight is more terrible to sheep than that of a dog. All their aseo-

ciations with him warn them of danger and destruction. It is related of Mr. *Jefferson*, to whom a well-broken Shepherd's Dog had been sent from abroad, that after explaining to his visitors the sagacity and usefulness of the Shepherd's Dog, he led them to the fields, taking along the dog, to give them an exhibition of his fine qualities. On the first indication of what he was to do, the dog made for the sheep, and they scattered in all directions, terrified to death, and the dog not much less confounded at their strange behavior. Some of them threw themselves over precipices, and the dog was never recovered.

Sheep must be brought up in familiar intercourse with the dog, that he may mind and manage them. The fear of dogs, with our sheep, is doubtless hereditary, as are other qualities of animals, of which many and curious instances might be given. In a communication to the Royal Society in 1807, Mr. Knight cited several instances of domesticated animals inheriting the *acquired* habits of their parents. In all animals, he says, this is observable; but in the dog, he says, it exists to a wonderful extent, and the offspring appears to inherit not only the passions and propensities, but even the resentments of the family from which he springs.—"I ascertained that a terrier, whose parents had been in the habit of fighting with polecats, will instantly show every mark of anger when he first perceives the scent of that animal, though the animal itself be wholly concealed from his sight."

In MARTIN'S HISTORY OF THE DOG, he says: "The Shepherd's Dog is of middle stature, or rather low in proportion to its length, slightly but vigorously formed, and quick and active in its movements. Though not quarrelsome, it is very courageous, and will resolutely encounter the fox in defence of the sheep; and though, unlike the spaniel, it is indifferent to caresses, and distant toward strangers, yet to its master it is most devotedly attached. When the labor of the day is over—when the sheep are folded for the night—it returns with him home to his humble cottage, and there curls up underneath his chair, or sits by his side and partakes of his simple repast. Where flocks are of large extent, and have to be watched during the night, and in cases where several hundred weaning lambs, wild and capricious, demand the care of the shepherd night and day—when winter storms of snow come on, and the scattered sheep have to be hastily collected and brought to a place of security, it is then that the shepherd feels to the full the value of his dog. A circuit of miles on the dreary hills or mountain-side, or over vast and trackless downs, has to be taken, and that without loss of time; to the dog is this duty entrusted, and well does he perform his office; not a sheep belonging to his master's flock is missing—unless, indeed, any have been stolen or killed; the whole are gathered together without intermixture with the sheep of other owners."

* * * * * *

"We have often seen the Drover's Dogs, at their master's bidding, single both sheep and cattle from the drove, and separate them, or drive them to some spot apart from the rest; we have seen them part the droves of two or more drovers traveling in company, which have become mingled together at a halting-place by the road-side, and arrange them in order for continuing the journey; we have seen them turn back the herd from a forbidden lane or gateway, or run before and plant themselves in the way, so as to prevent any of the cattle from going astray. During his long, slow journey from the west or the north of our island to the great capital, the drover finds his dog of all-important utility; nor without this assistant could the crowded cattle in Smithfield Market be at all managed."

The following farther extracts from the same work will be found entertaining, especially the one from Darwin's journal:

The dog is intelligent, but some breeds are far more so than others, and some individuals are elevated above their fellows. Greatly indeed does the cerebral development vary in different races (and consequently the cranial capacity relative to the rest of the skull), as may be seen by comparing the skulls together. The superiority in this respect of the skull of the spaniel over that of the bull-dog is most decided,—and it is in the spaniel, and those breeds most nearly related to it, that we observe the greatest intelligence and tractability. In the Bull-Dog and mastiff, on the contrary, the bold inter-parietal and occipital ridges of the skull demonstrate the force and volume of the muscles of the jaw and neck. It is in these dogs that we find the most indomitable courage and the most combative disposition. M. Elzéar Blaze says, "Le chien est courageux, mais son courage augment beaucoup en la présence de son maître, soit qu'il veuille le défendre, soit qu'il se sente plus forte d'un tel appui, soit enfin qu'il veuille mériter son estime."* The fact is, that so utterly subjugated is the dog and so dependent on man, that he looks to his master for support and encouragement, and even the most pugnacious dogs fight more resolutely when they are encouraged by their master's voice. In South America, the large sheep-dogs which guard the flocks display courage only when in charge of the sheep. The following extract from Mr. Darwin's journal is very interesting:—"While staying at this estancia (in Banda Oriental) I was amused with what I saw and heard of the Shepherd Dogs of the country. When riding, it is a common thing to meet a large flock of sheep guarded by one or two dogs, at the distance of some miles from any house or man. I often wondered how so firm a friendship had been established. The method of education consists in separating the puppy, when very young, from the bitch, and in accustoming it to its future companions. An ewe is held three or four times a day for the little thing to suck, and a nest of wool is made for it in the sheep-pen.—At no time is it allowed to associate with other dogs, or with the children of the family. The puppy, moreover, is generally castrated; so that when grown up, it can scarcely have any feelings in common with the rest of its kind. From this education it has no wish to leave the flock, and just as another dog will defend its master,

* "The dog is courageous, but his courage increases in the presence of his master; whether it be that he wishes to defend him, or that he feels himself stronger with such assistance, or that he desires to merit his approbation."

man, so will these the sheep. It is amusing to observe, when approaching a flock, how the dog immediately advances barking—and the sheep all close in his rear as if round the oldest ram. These dogs are also easily taught to bring home the flock at a certain time in the evening. Their most troublesome fault when young is their desire of playing with the sheep, for in their play they sometimes gallop their poor subjects most unmercifully. The Shepherd Dog comes to the house every day for some meat, and immediately it is given him he skulks away as if ashamed of himself. On these occasions the House Dogs are very tyrannical, and the least of them will attack and pursue the stranger. The minute, however, the latter has reached the flock, he turns round and begins to bark, and then all the House Dogs take very quickly to their heels. In a similar manner a whole pack of the hungry Wild Dogs will scarcely ever (and I was told by some, never) venture to attack a flock guarded even by one of these faithful shepherds.* The whole account appears to me a curious instance of the pliability of the affections of the dog race; and yet, whether wild, or however educated, with a mutual feeling of respect and fear for those that are fulfilling their instinct of association. For we can understand on no principle the wild dogs being driven away by the single one with its flock, except that they consider, from some confused notion, that the one thus associated gains power, as if in company with its own kind. F. Cuvier has observed that all animals which enter into domestication consider man as a member of their society, and thus they fulfil their instinct of association. In the above case, the Shepherd Dogs rank the sheep as their brethren; and the Wild Dogs, though knowing that the individual sheep are not dogs, but are good to eat, yet partly consent to this view, when seeing them in a flock, with a Shepherd Dog at their head." It appears to us that the Shepherd Dog, in this instance, regards the sheep as his supporters and his care, and feels exactly what a House Dog feels when strangers or strange dogs intrude upon the premises. We have frequently seen a large dog under such circumstances retreat before one of inferior power, which he would not have done otherwise. The Wild Dogs spoken of by Mr. Darwin are dogs left to themselves, and which, like the horses and cattle, have resumed a life of independence; but perhaps they have not learned the power which union gives, and each thinking only of itself individually, fears to attack a champion who stands so boldly on the defensive. The circumstance of the dog regarding itself as one of a flock of sheep, and as the guard of those sheep, and not the friend and servant of one master, is not without a parallel under other circumstances, in which the animal attaches itself not to one, but to a collective number of individuals, which together constitute a master. We say nothing of the Fireman's Dog, of which everybody has heard; there are other examples upon record. "In the first regiment of the Royal Guards," says M. Blaze, "we had a dog called *Bataillon*. Entertained by the soldiers at the guard-house, he always remained there; his masters changed every twenty-four hours; but that gave him no uneasiness. Sure of his pittance, there he stayed. He would follow no one to the barracks; but looked upon himself as the humble servant of twelve soldiers, two corporals, a sergeant, and drummer, whoever they might happen to be; and without being uneasy about the matter. During the night, when it froze hard, the sentinel frequently called *Bataillon*, and took his place to warm himself at the stove: the dog would have suffered death rather than have passed beyond the door. When we changed garrison, the dog followed the regiment, and immediately installed himself in the guard-house of the new barracks. He knew all the soldiers—he caressed them all, but would take no notice of those who did not wear our uniform. To this dog the regiment was a master—an individual whom he loved. His feeling was for blue dresses with amaranth facings—he despised all other colors."

It is owing to the difference among the varieties of the Domestic Dog in some respects—as in docility, strength, size, speed, keenness of scent, ferocity, &c.; and their similarity in others, as attachment to their masters, fidelity, &c. —that there is scarcely any purpose to which the dog has not been put. Like man, he follows different occupations; the Street Dogs are the lazzaroni of their race. In the earliest times, the dog, like his master, was a mighty hunter. The chase of the ferocious or of the swift was his occupation; he brought the wolf, the wild boar, and the lion, to bay; or tired down the deer and antelope. Soon, however, war became a game at which kings played, and *Væ Victis!* for war in a semi-civilized state of society is unmitigated by moderation or humanity. Then was the dog called from the chase, or from guarding against savage brutes the peaceful flocks and herds, to assist human brutes in the destruction of each other; the dog became a warrior, and a most formidable one, either in the citadel, the entrenched camp, or the battle-field. Shakspeare's expression put into the mouth of Anthony, "Cry havoc, and let slip the dogs of war!" is by no means metaphorical.—Dogs of war had long been used before, and were so long after the time of the first bald Cæsar.

Watch dogs were not only kept within the citadel of Rome, but in all the fortresses of the Greeks. The citadel of Corinth was guarded externally by an advanced post of fifty dogs placed 'en vidette' on the sea-shore. One night the garrison slept, overcome with wine: the enemy disembarked, but were received by the fifty dogs, who fought with indomitable courage till forty-nine fell. The survivor, named Soter—history has preserved his name—retreated from the field of battle to the citadel, and gave the alarm; the soldiers were roused, and the enemy was repelled. The Senate ordained that Soter should wear a silver collar, with this inscription, "Soter, defender and preserver of Corinth."

* To these dogs Azara alludes in the following passage:—"Among the dogs, the ovegeros, or Sheep Dogs, are particularly deserving of notice, because in this country, where there are no shepherds, they act in the place of the latter, and take charge of the flocks. Early in the morning they drive the flocks from the fold, conduct them to the plain, accompanying them the whole day, and keeping them united;—and when numerous they surround the flock, defending them from birds of prey, from wild dogs, and other beasts, and even from man, and from every kind of injury. At sunset they conduct the sheep back to the fold, when they lay themselves down upon the ground and sleep, and pass the night in their watchful care over them. If any of the lambs lag behind, they carefully take them up in their mouths, and carry them for a time, returning again and again, if need be, until none remain."

BEES—*Effect of Exposing Bee-Hives to Hot Sunshine.*—It has been mentioned that honey-combs melt when the hives are exposed to a hot sun; but as that happens but seldom, it may be worth while to relate how the catastrophe operates on the bees. Last season a friend of mine had a strong colony, in a straw hive, exposed to the sun. In July he was anxious for the bees to work in a glass on the top of the hive; the entrance being small the heat in the hive increased, so that the combs collapsed. The drenched bees turned outside the hive; while the hum of those that could not enter, caused the affair to be observed. Being at a distance I did not see the catastrophe until the next day. Under the hive were dishes collecting the honey dropping from it, in which many of the poor bees were drenched in their treasure; while outside the hive was literally covered with bees escaping from the wreck. After a little maneuvering, I removed the hive, and part of the combs fell on the floor, crushing many of the bees. Having cleared the floor, and also the broken combs from the hive, after the honey had drained a little, the hive was placed in its former station, fenced from the sun by a cloth. The bees soon took possession again, excepting those that happened to fall on the ground, which were in a sad plight, smeared with honey and dust. In order to relieve them I put the whole into a pail of water, then spread them on a cloth to clean themselves in the sun, which they did, excepting those that were disabled. It is unnecessary to say that if the hive had been shaded the calamity would not have happened; but before honey-combs collapse, a hive must be hot indeed. It is surprising what an amount of heat bees can stand inside their hive, even until they are drenched by the vapor from their own perspiration. In hot countries that moisture may be of use to bees; for in summer, with us, they are fond of sipping or licking it; but damp in winter causes their combs to turn mouldy, and often proves destructive to colonies.

[London Gardener's Chronicle.

EGG CEMENT.—White of egg thickened with finely-powdered quick-lime. *Use.* To mend earthenware, glass, china, marble, alabaster, spar ornaments, &c. It does not resist moisture.

PRICES CURRENT.

[*Corrected, February* 18, *for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort	₱ 100 lb.	3	93¾	@	4	—
Pearls, 1st sort, '45		4	25	@	—	—
BEESWAX—American Yellow		—	29	@	—	29½
CANDLES—Mould, Tallow	₱ lb.	—	9	@	—	11
Sperm, Eastern and City		—	26	@	—	38
COTTON—From	₱ lb.	—	6⅞	@	—	9½
COTTON BAGGING—American		—	12	@	—	13
CORDAGE—American	₱ lb.	—	11	@	—	12
DOMESTIC GOODS—Shirtings	₱ y.	—	5½	@	—	11
Sheetings		—	7	@	—	15
FEATHERS—American, live		—	26	@	—	31
FLAX—American		—	7	@	—	7½
FLOUR & MEAL—Genesee	₱ bbl.	5	56¼	@	5	62½
Troy		—	—	@	—	—
Michigan		5	50	@	5	56¼
Ohio, flat hoop		5	50	@	5	56¼
Ohio, Heywood & Venice		6	37½	@	6	50
Ohio, via New-Orleans		5	25	@	5	37½
Pennsylvania		—	—	@	—	—
Brandywine		—	—	@	5	75
Georgetown		5	37½	@	5	50
Baltimore City Mills		5	12½	@	5	25
Richmond City Mills		6	62½	@	6	75
Richmond Country		5	12½	@	5	25
Alexandria, Petersburg, &c.		5	12½	@	5	25
Rye Flour		4	—	@	—	—
Corn Meal, Jersey and Brand		3	75	@	4	—
Corn Meal, Brandywine	hhd.	17	50	@	—	—
GRAIN—Wheat, Western	₱ bush.	1	15	@	1	25
Wheat, Southern	new	1	12½	@	1	20
Rye, Northern		—	—	@	—	80
Corn, Jersey and North	(meas.)	—	68	@	—	70
Corn, Southern	(measure)	—	—	@	—	—
Corn, Southern	(weight)	—	63	@	—	65
Oats, Northern		—	47	@	—	—
Oats, Southern		—	38	@	—	—
HAY—North River	bales	—	80	@	—	90
HEMP—American, dew-rotted	ton	85	—	@	100	—
" " water-rotted		125	—	@	175	—
HOPS—1st sort, 1845		—	20	@	—	25
IRON—American Pig, No 1		35	—	@	37	—
" Common		25	—	@	30	—
LIME—Thomaston	₱ bbl.	—	—	@	1	05
LUMBER—Boards, N.R.	₱ M. ft. clr.	35	—	@	40	—
Boards, Eastern Pine		11	—	@	13	—
Boards, Albany Pine	₱ pce.	—	10	@	—	19
Plank, Georgia Pine	₱ M. ft	—	—	@	35	—
Staves, White Oak, pipe	₱ M.	50	—	@	52	—
Staves, White Oak, hhd		40	—	@	42	—
Staves, White Oak, bbl		30	—	@	32	—
Staves, Red Oak, hhd		28	—	@	30	—
Hoops		25	—	@	30	—
Scantling, Pine, Eastern		—	—	@	16	25
Scantling, Oak		30	—	@	35	—
Timber, Oak	₱ cubic foot	—	25	@	—	37
Timber, White Pine		—	18	@	—	25
Timber, Georgia Yellow Pine		—	30	@	—	35
Shingles, 18 in	₱ bunch	1	75	@	2	—
Shingles, Cedar, 3 feet, 1st quality		—	—	@	24	—
Shingles, Cedar, 3 feet, 2d quality		22	—	@	23	—
Shingles, Cedar, 2 feet, 1st quality		19	—	@	—	—
Shingles, Cedar, 2 feet, 2d quality		16	—	@	18	—
Shingles, Cypress, 2 feet		13	—	@	14	—
Shingles, Company		—	—	@	29	—
MUSTARD—American		—	17	@	—	25
NAILS—Wrought, 6d to 20d	₱ lb.	—	10	@	—	12½
Cut, 4d to 40d		—	4	@	—	4½
PLASTER PARIS—₱ ton		2	62½	@	—	—
PROVISIONS—Beef, Mess,	₱ bbl.	8	—	@	8	50
Beef, Prime,		5	—	@	5	50
Pork, Mess, Ohio		11	—	@	12	50
Pork, Prime, Ohio		9	50	@	10	—
Lard, Ohio	₱ lb.	—	7	@	—	8
Hams, Pickled		—	7	@	—	—
Shoulders, Pickled		—	5	@	—	—
Sides, Pickled		—	6	@	—	6½
Beef, Smoked	₱ lb.	—	6½	@	—	7
Butter, Orange County		—	15	@	—	20
Butter, Western Dairy		—	13	@	—	15
Butter, ordinary		—	11	@	—	13
Cheese, in casks and boxes		—	7	@	—	7½
SEEDS—Clover	₱ lb.	—	8½	@	—	9
Timothy	₱ tierce	15	—	@	18	—
Flax, Rough		10	—	@	—	—
SOAP—N. York, Brown	₱ lb.	—	4	@	—	6
TALLOW—American, Rendered		—	7½	@	—	7⅝
TOBACCO—Virginia	@ lb.	—	3	@	—	6
North Carolina		—	3	@	—	5
Kentucky and Missouri		—	3	@	—	7
WOOL—Am. Saxony, Fleece,	₱ lb.	—	38	@	—	40
American Full Blood Merino		—	36	@	—	38
American ½ and ¾ Merino		—	30	@	—	33
American Native and ¼ Merino		—	26	@	—	28
Superfine, Pulled		—	23	@	—	30

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GUANO:

ITS NATURE AND USE.

BY PROFESSOR HARDY, OF VA.

[☞ The following article, from the pen of Professor HARDY, we deem of sufficient importance to occupy the first place in the Agricultural Journal for the present month. The nature and qualities of different kinds of Manures are attracting the attention of intelligent farmers at the present time, to an extent quite unknown in the previous agricultural history of our country. Especially is this remark true of Guano—the peculiar properties of which, together with the experiments which have been made and the results ascertained by its use in the United States and elsewhere, are so ably and lucidly set forth by Mr. HARDY in the following pages:]

To J. S. SKINNER, Esq.—

Sir: The attention of our agricultural community has been specially directed, within a year or two past, to the use of Guano as a manure, but no decisive results, it seems, have yet been obtained in this country. It may, perhaps, be useful now, before another crop is planted, to review the subject and ascertain, if possible, what has been done and what may be expected. I design, at the present time, to bring together, in as short space as possible, the most important facts known respecting this substance, and to add any suggestions which may be presented.

In 1806, Bonplaee and Humboldt delivered to MM. Vanquelin and Fourcroy a specimen of Peruvian Guano for analysis. They found that it contained 25 per cent. of uric acid combined with ammonia and potassa; also oxalate of ammonia, sal ammoniac, oxalate of potassa, phosphates of potassa and lime, chloride of potassium, fatty matter and sand. Since these results were published, several analyses have been attempted; and we shall place before the reader, in the following tables, such accounts as we have in hand. We place first the analyses of Völkel, Klaproth and Bartels.

Substances.	VÖLKEL.	KLAPROTH.	BARTELS.
Urate of ammonia	9·0	16·0	3·244
Oxalate of ammonia	10·6		13·351
Oxalate of lime	7·0	12·75	16·360
Phosphate of ammonia	6·0		6·250
Phosphate of ammonia and lime	2·6		4 196
Sulphate of potassa	5·5		4·227
Sulphate of soda	3·8		1·119
Phosphate of soda			5·291
Hydrochlorate of am'onia,	4·2		6·500
Phosphate of lime	14·3	10·00	9·940
Clay and sand	4·7	32·00	5·800
Common salt		0·05	0·100
Cereal matter (wax)			0·600
Alumina			0·104
Loss, including ammonia, organic matter, and water	32·3	28·75	22·918
Total	100·00	99·55	100·000

Mr. Hennell, of Apothecaries' Hall, England, has analyzed Guano, and his results are given

in the table below. Dr. Fownes has analyzed two samples—one "of a light brown color and extremely offensive smell," the other "deeper in color and without smell."

Substances.	Hennell.	Dr. Fownes. No. 1.	Dr. Fownes. No. 2.
Phosphate of lime	30·5		
Phosphate of lime and magnesia		29·2	41·2
Oxalate of ammonia, uric acid, carbonate of ammonia, organic matter, and water	66·5	66·2	44·6
Alkaline phosphates, chlorides, and sulphates	3·0	4·6	14·2
Total	100·0	100·0	100·0

Prof. Johnston took two specimens of Guano from the same box, and found in one 8 per cent. of sand. and in the other 1 1-5 per cent. The other constituents are given in the following table:

Substances. Johnston—No. 1.	
Water, salts of ammonia, and organic matter, expelled by a red heat	23·5
Sulphate of soda	1·8
Common salt, with a little phosphate of soda	30·3
Phosphate of lime, with a little phosphate of magnesia and carbonate of lime	44·4
Total	100·0

Substances. No. 2.	
Water, and carbonic and oxalic acids, &c. expelled by a red heat	51·5
Ammonia	7·0
Uric acid	0·8
Common salt, with a little phosphate and sulphate of soda	11·4
Phosphate of lime, with a little phosphate of magnesia and carbonate of lime	29·3
Total	100·0

The preceding tables give the composition of South American Guano; the African has been analyzed by the joint labors of Dr. Ure and the Messrs. Francis and Philips. Their analyses of three specimens are found in the next table:

Substances.	No. 1.	No. 2.	No. 3.
Water	27·13	28·5	26·0
Ammonia	9·7		7·2
Ammoniacal salts, organic matter, and uric acid	32·96	46·5	38·8
Alkaline salts, chiefly potassa, with sulphuric acid, phosphoric acid, and hydrochloric acid	7·08	6·0	4·2
Phosphates of lime, magnesia, &c.	22·32	18·5	19·8
Sand	0·81	0·5	4·0
Total	100·00	100·0	100·0

Dr. Ure has also published the average of several analyses performed by himself.

Dr. Ure's Average.*

Organic matter, containing nitrogen, and capable of affording from 8 to 17 per cent. of ammonia by slow decomposition in the soil	50·0
Water	11·0
Phosphate of lime	25·0
Ammonia, phosphate of magnesia, phosphate of ammonia, and oxalate of ammonia, containing from 4 to 9 per cent. of ammonia	13·0
Silicious matter from the crops of the birds	1·0
Total	100·0

* For these tables I am indebted to the various works of Liebig, Boussingault, Petzholdt, Johnston, Thaër, and to the Farmers' Library.

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During the summer of 1845, I received a specimen of Guano from Dr. Tignal Jones, of this county: it was obtained by the Agricultural Club, of which he is a member, from Messrs. McIlvaine and Brownley, Petersburg, Va., and warranted to be the genuine South American. The following results have been obtained from its examination:

Water at the temperature of 115° F. dissolves 66·5 per cent.

Hydrochloric acid dissolves 90 per cent.

From 100 grains, by the use of lime and hydrochloric acid, I get 25 grains of sal ammoniac.

According to Petzholdt, 68 per cent. of the genuine Guano is soluble in lukewarm water, 94 per cent. in hydrochloric acid, and 100 grains give 27 of sal ammoniac. By comparing these numbers with those I have obtained, any one can form an opinion as to the genuineness of the article. Considering the variable composition of Guano, I should conclude that the specimen I have received is genuine, though the preceding results would seem to justify some doubt.

As I have attempted to examine this specimen with some accuracy, it may, perhaps, be interesting to some of my readers to know my results. In the succeeding table I give them for three different analyses:

Substances.	No. 1.	No. 2.	No. 3.
Ammonia	8·33	7·90	8·12
Water, and carbonic, oxalic and uric acids, &c. expelled by a red heat	56·50	55·30	58·00
Common salt, phosphoric and sulphuric acids, with soda, &c.	9·27	10·12	9·00
Phosphate of lime and magnesia	24·60	25·50	23·50
Sand (nearly uniform)	1·00	1·00	1·00
Loss	0·30	0·18	0·38
Total	100·00	100·00	100·00

The specimen I examined was of a light brown color, earthy appearance and offensive smell, with small white portions intermingling with the mass.

By a comparison of any of the preceding tables, we shall perceive that the composition of Guano is by no means uniform. Of the fifteen analyses given, no two are identical; and, indeed, the methods of research adopted by chemists, as well as the terms in which their results are stated, are so various that the composition of the manure appears to be less uniform than it is in fact. The results of Völkel, Klaproth and Bartels, who, more than any other chemists, have given the ultimate constituents, are similar, though far from being identical; and the same remark might also be made of Dr. Ure's average, Prof. Johnston's analyses, and my own (if I may compare mine with theirs). A similar approximation is found in the table containing the results of Mr. Hennell and Dr. Fownes.—But, notwithstanding these real approximations,

the conclusion, from the tables, is yet inevitable that the composition of Guano is exceedingly variable.

It must be observed, however, that, while its composition is not uniform, it contains large amounts of the earthy phosphates and the ammoniacal and alkaline salts, all of which are considered active manures. We may consider it an impure compound of the phosphates of lime and magnesia, and of the ammoniacal and alkaline salts.

Several attempts have been made to form artificial Guano—that is, to combine salts in such proportions that the mixture shall have the same properties and value as Guano. As the supply of natural Guano is thought to be limited, it is matter of importance to form an artificial compound of equal value, if, indeed, the substance be as valuable in Agriculture as some have represented. I shall add, therefore, at this place, the composition of one or two specimens of artificial Guano. The following is that recommended by Petzholdt:

Bone dust, or phosphate of lime	3 cwt.
Sulphate of ammonia	1 cwt.
Common salt	1 cwt.
Sulphate of soda	10 lbs.
Pearlash	10 lbs.
Total	520 lbs.

I give also the composition of Johnston's mixture, the basis of Turnbull's artificial Guano, mentioned in a succeeding table:

Bone dust, or phosphate of lime	315 lbs.*
Sulphate of ammonia	100 lbs.
Pearlash	5 lbs.
Common salt	100 lbs.
Dry sulphate of soda	11 lbs.
Total	531 lbs.

Johnston considers this amount fully equal in efficacy to 4 cwt. of Guano which cost more than twice as much.

Dr. Liebig has undertaken to reduce the same principle to practice on a large scale. His object is to form an artificial Guano or manure for every plant. Having determined its mineral constituents, and the ratio in which they enter the plant, he combines on this basis various salts, to form a manure suitable for the plant. The mineral constituents of Havana tobacco, for instance, may be stated as follows:

Salts of potassa and soda	24·30
" Magnesia and lime	67·40
Silica	8·30
Total	100·00

The principle is obvious and rational that these substances, combined in the ratio of the corresponding numbers, should form a sufficient manure for Havana tobacco. We may safely pronounce as to the correctness of the theory involved, and may we not hope that experience and skill will develop results of high interest to Agriculture? Perhaps the introduction of Guano, as a manure among us, may be of greater benefit to Agriculture, by suggesting new methods of forming artificial manures, than by any special use we can make of the natural substance.

I shall now proceed to notice, as briefly as possible, those facts which bear on the value of Guano in practical Agriculture.

Prof. Johnston says:—"Its real origin was known to the government of the Incas, and its national importance fully understood. It was made a capital offence to kill the young birds on the Guano Islands." It has been used in Peru for so long a period that "the memory of man runneth not to the contrary," contributing more to the happiness of the people and the security of Government than her richest mines. The small rocky islands, Chinche, Ilo, Iza and Arica, have for ages been the source of agricultural wealth to the neighboring nations. Humboldt stated more than twenty years ago that "fifty vessels were annually loaded at Chinche alone with the Guano, each trader carrying from one thousand five hundred to two thousand cubic feet." The Peruvian farmer uses it chiefly for Indian corn; and Mr. Bland, of Liverpool, who has resided on the coast of Peru many years, has stated—"In the valley of Chaucay, distant from Lima about forty miles, a soil which, *without* Guano, is capable of producing only 15 for 1 of Indian corn, *with* Guano is made to produce 300 for 1." It is not only employed for manure in the provinces which lie along the coast, but it is carried across the desert of Atacama many leagues inland, "on the backs of mules, over rough mountain paths, and at a great expense, for the use of the agricultural districts of Peru and Bolivia." Some have estimated that Peru alone purchases annually ten millions of pounds for her own use.

In the United States, and especially in Great Britain, many experiments have been made with the view of testing the value of Guano as a manure in those countries. All such experiments we shall not pretend to give, but we shall notice them at some length, both with the view of directing attention to them and with the hope that the Agriculturists of the United States may be excited to greater care in testing this and other manures.

Johnston in his admirable "Lectures on the Applications of Chemistry and Geology to Agriculture," has reported a large number of valuable results, obtained at the expense of much labor and skill. Every person who desires to be an intelligent farmer should have in his possession these "Lectures," from the press of Wiley

* 7 bushels—containing 35 lbs. Am.

& Putnam—a work containing, in our judgment, more agricultural science and information worthy of confidence than any other single work in the English language. The following tables embrace a small portion of what Johnston has reported respecting Guano:

TABLE I. *Comparative Experiments with various substances used as Manures for growing Irish Potatoes, planted 18th May and lifted 12th October, 1842. The quantity of land in each plot was one-sixteenth of an imperial acre.*

No.	Descriptions of Manures used, and kinds of Potatoes.	Quantity of manure per acre.	Produce in tons, &c. per acre.			Cost of manure per acre, in sterling money.		
	A—WHITE DON POTATO.		tons.	cwt.	qrs.	£	s.	d.
1.	Turnbull's humus	30 bushels	11	8	2	2	7	0
	Wood ashes, mixed	30 bushels						
2.	Rape dust	1 ton	12	6	2	8	12	0
3.	Turnbull's prepared bones	3 cwt.	13	14	1	0	18	0
4.	Turnbull's artificial Guano	3 cwt.	10	15	0	1	4	0
5.	Natural Guano	3 cwt.	18	9	0	3	17	0
	B.—RED DON POTATO.							
6.	Soil, simple		6	15	0	....	....	....
7.	Wood ashes	50 bush.	7	10	2	1	5	0
8.	Natural Guano	4 cwt.	14	6	5	5	0	0
9.	Do. and wood ashes	4 cwt. 25 bush. ashes	15	15	0	5	12	6
10.	Do. do. and wood charcoal	4 cwt. 20 bush. charcoal	17	10	0	6	0	0
11.	Turnbull's artificial Guano	4 cwt.	12	15	0	1	12	0
12.	Do. and wood ashes	4 cwt. 25 bush. ashes	12	15	0	2	4	6
13.	Turnbull's prepared bones, and wood ashes	4 cwt. 25 bush. ashes	13	14	1	1	16	6
14.	Turnbull's prepared bones	4 cwt.	12	15	0	1	4	0
15.	Rape dust	1 ton	10	0	0	8	12	0
16.	Do. and wood ashes	1 ton, 25 bush. ashes	14	0	0	9	4	6
17.	Potash and quick-lime, (1 lb. potash to 1½ tons lime)	60 bush.	9	15	0	2	2	0
18.	Gypsum	5 cwt.	9	15	0	0	12	6
19	Salt and quick-lime, (4 cwt. salt to 1½ tons lime	60 bush.	8	10	0	1	0	0
20.	Bone dust	45 bush.	9	15	0	6	14	0
	C.—CONNAUGHT CUPS POTATO.							
21.	Soil, simple		5	15	0	....	....	....
22.	Bone dust	45 bush.	9	15	0	6	14	0
23.	Natural Guano	4 cwt.	13	14	1	5	1	6
24.	Rape dust	1 ton	13	0	0	8	12	0

The above manures were put in with the potato cutting—no top-dressing being afterward applied.

TABLE II. *Comparative Effects of Guano, Farm-yard Manure, Gypsum, &c. by themselves and in mixture upon Potatoes, of different varieties, planted 25th, 26th and 27th April—lifted, measured and weighed from 12th to 14th October, 1843—on one-eighth of an imperial acre.**

No.	Manures.	Quantity applied.			Cost of Manure.			Produce per acre.		Value of Potatoes at 40s. per ton.		Variety of Potato used.
		c. yds.	qrs.	lbs.	£	s.	d.	tons.	cwt.	£	s.	
1	Guano		1	14	0	3	9	19	5	38	10	Perths, Reds.
	Farm-yard manure	2½			0	12	6					
2	Guano		1	14	0	3	9	17	0	34	0	Rough Reds.
	Farm-yard manure	2½			0	12	6					
3	Farm-yard manure	5			1	5	0	14	15	29	10	Do.
4	Guano		1	14	0	3	9	16	0	32	0	Cups.
	Farm-yard manure	2½			0	12	6					
5	Guano		1	14	0	3	9	18	0	36	0	Do.
	Farm-yard manure	2½			0	12	6					
	Gypsum			14	0	0	2¼					
6	Farm-yard manure	5			1	5	0	15	5	30	10	Do.
	Gypsum (top-dr.)		1		0	0	2					
7	Farm-yard manure	5			1	5	0	14	0	28	0	Do.
8	Guano		1	14	0	3	9	16	5	32	10	Buffs.
	Farm-yard manure	2½			0	12	6					
9	Guano		2	14	0	6	3	15	0	30	0	Do.
10	Farm-yard manure	5			0	1	5	12	0	24	0	Berw'ks, Blues*
11	Guano		2	14	0	6	3	10	15	21	10	Do.

* For some information as to the terms used in these tables, and in the "Lectures" by Prof. Johnston, see *Note* at the end of this communication.

TABLE III. *Comparative Effects of Guano and other Manures on Turnips, Potatoes, Wheat, Barley, Oats, Beans, and Hay.*

SWEDISH TURNIPS,

	Top-dressed with		Produce per acre. Tons.	Cwt.
1.	Farm-yard manure	20 tons	18	11
	Guano	3 cwt.	23	8
2.	Farm-yard manure	20 tons	16	18
	Guano*	2½ cwt.	17	4
	Bones	32 bush.	15	17
	YELLOW TURNIPS.			
	Guano†	5 cwt.	32	2
	Rape dust	15 cwt.	24	11
	Bone dust	30 bush.	17	2
	POTATOES.‡			
1.	Guano	3 cwt.	18	9
	Rape dust	1 ton	12	6
2.	Guano	4 cwt.	14	6
	Rape dust	1 ton	10	0
	Bone dust	45 bush.	9	15
3.	Guano	4 cwt.	13	14
	Rape dust	1 ton	13	0
	Bone dust	45 bush.	13	14
	WHEAT.		Bush.	Lbs.
1.	Guano	1 cwt.	48	0
	Rape dust	16 cwt.	51	0
	Undressed		47½	0
2.	Guano	3 cwt.	30	40
	Undressed		24	56
3.	Guano	2 cwt.	32	20
	Undressed		31	31
4.	Guano	1 cwt.	46	15
	Nitrate of soda	1 cwt.	51	18
	Undressed		44	4
5.	Guano	1¼ cwt.	45	0
	Nitrate of soda	1¼ cwt.	41	0
	Undressed		39	0
	BARLEY.			
	Guano	3 cwt.	64	0
	Undressed		47	15
	OATS.			
1.	Guano	2 cwt.	70	0
	Undressed		52	0
2.	Guano	1 cwt.	48	16
	Nitrate of soda	1 cwt.	50	0
	Undressed		49	0
	BEANS.			
	Guano	2 cwt.	33½	0
	Rape dust	16 cwt.	35	0
	Nitrate of soda	1 cwt.	33	0
	Undressed		29¾	0
	HAY.		Tons.	Cwt.
1.	Guano	1½ cwt.	1	18
	Nitrate of soda	1½ cwt.	2	10
	Undressed		1	8
2.	Guano	1½ cwt.	2	2
	Nitrate of soda	1½ cwt.	1	17
	Undressed		1	10

The various localities where these results were obtained we omit to mention; we also leave our agricultural readers to make their own inferences from the tables.

Robert Monteith, Esq., and David Barclay, Esq., M. P., have published the results of experiments, made by themselves, very favorable to the use of Guano. (Vide MONTHLY JOURNAL OF AGRICULTURE, pp. 134—364.)

What was declared as the opinion of a club of English farmers in 1845, seems to be the prevailing opinion in Great Britain, "that Guano is an important auxiliary to the resources of the farmer in obtaining luxuriant crops, and is the cheapest and most important substitute for farm-yard manure, being found, in some instances to produce as good crops at half the cost." (Vide MONTHLY JOURNAL OF AGRICULTURE, p. 241.)

In the preceding tables of Prof. Johnston, we observe some instances where Guano, applied as a top-dressing to wheat and oats, had no beneficial effect, and, in other cases, its benefit was very partial. The excessive drouth of 1842 is assigned as the cause of these failures, and it is also probable that Guano is not so apt to have a favorable influence, if applied as a top-dressing.

Omitting much that has been reported by English experimenters, we pass to what has been done in the United States. Very few, if any, accurate experiments has been made in this country within our knowledge, and the larger portion of what we shall use may be found in detail at page 29 of the MONTHLY JOURNAL OF AGRICULTURE.

Twenty years ago, Governor Lloyd, of Maryland, reported "that the effects of Guano as applied to Indian corn were remarkably favorable." Mr. Mackenzie has published in the Southern Planter that, after applying it in various ways to wheat, corn, and oats, "the money and labor he has expended on Guano have been entirely thrown away." Mr. Tatum, of the Farmers' Cabinet, gives an account of some trials on the farm of Mr. Richie, near New-York; one of which he thinks shows, at any rate, "that there is virtue in Guano." In this case it was applied to oats. Mr. Stabler, of Maryland, has reported very favorably of its effects on his wheat and oats, and concludes that his crop of 1845 will *twice overpay* him for the Guano used. In some experiments by Hon. Mr. Pearce, it was applied to grass, wheat, oats, clover and corn. With grass, wheat and clover, the effect was favorable; with oats and corn, unfavorable. "So far" he says, "I am much pleased with the Guano." Dr. Dupuy and T. P. Pleasants of Petersburg, Virginia, have published very encouraging accounts of its application to tobacco plants, cabbage plants, and other garden vegetables; also wheat, oats, and Irish Potatoes. They failed in some instances, on account of the drouth of last year. Mr. Pleasants says, "In fine, considering the character of the season, the results are in almost every way satisfactory." More recently, on page 413 of the Journal, he gives a still more favorable account of these experiments at Petersburg, and concludes, "I feel no hesitation in making another trial." Mr. Oddie,

* Mixed with 1 cwt. of charcoal powder.
† Mixed with 20 bush. wood ashes.
‡ The manure was here applied to the potato cuttings.

of Rockland, New York, steeps his seed in the liquid Guano, and finds it to be an admirable emetic for the crows—the best scare-crow extant."—a rather odd application of *bird-dung*.

Mr. Teschemacher of Boston, a man both of scientific and practical knowledge, holds the following language on the subject: "I confess I am surprised to hear of so many failures—*all* which I have been able to investigate arise from error in application. In no soil but a stiff clay can it fail to produce its effects; in no soil but one amply provided already with phosphate of lime can its effects fail to be permanent." (Vide Mon. Jour. Agr., p. 150.)

I have received from gentlemen of this county some information as to their use of Guano. Capt. H. Lockett, having mixed it with ashes in the ratio of one measure to seven, applied the mixture to a portion of tobacco, at the same time applying wood-ashes to another portion. He observed no difference between the effects of the mixture and those of the ashes alone. In both instances the crop was more thriving than on the land not manured.

J. J. Williamson, Esq., used it for wheat and tobacco. For tobacco, not more than a teaspoonful to the hill; the crop was as good as that on much stronger land. Wheat, top-dressed, became green, but the crop was not thought to be larger.

Alexander Jones, Esq., used a mixture of 8 lbs. of Guano, to a half bushel of wood ashes and applied it to a *patch* of tobacco plants 10 by 16. It killed them outright. With wheat it was more tolerable

These gentlemen agree in the opinion that the severe drouth of last year seriously interfered in their experiments with Guano.*

Such is the sum of our information on the use of this manure in Great Britain and this country. One or two obvious remarks present themselves.

1. It is doubtful according to the testimony presented above, whether Guano can be used profitably in the United States. Future experiments must determine the question.

2. Considering the beneficial effects of Guano in England and the conflicting accounts as to its use in this country during the unusually dry season of 1845., it should seem that agriculturists ought to be encouraged to give the manure a fair and full trial the present year. No manure untried before and elsewhere beneficial can be prudently discarded by the American farmer, because it was not able to contend successfully with the drouth of the past season.

3. Whatever other conclusion may be drawn from the results we have brought together, it is obvious that English farmers have attained to greater precision and skill than the American in conducting agricultural experiments. We shall, therefore, close this essay with a few suggestions respecting such experiments.

1. The object of the experiments should be *to test the comparative value of different manures as to specific crops.* Statements of a general indefinite nature are of little value. Precision is as important as correctness.

2d. The quantity of land manured in each case should be measured; the kind, cost and amount of each manure, and the time and manner of its application should be given; the crop, when mature, should be carefully gathered, weighed, or measured; and the relative cost of the manures per 100 lbs. or bushel should be precisely ascertained.

Tables 1 and 2 are well constructed and may be safely imitated by all who wish to obtain and publish accurate information. In all instances an equal portion of unmanured land should be cultivated.

3d. If scientific men could be employed, the land, the manures and the crops should be analyzed. While this cannot be expected in but few instances, it should be attempted wherever it is practicable; and the result must be highly creditable both to American science and American husbandry.

4th. Every agricultural club and association should have in view at all seasons of the year some well-defined specific objects to be accomplished. The subjects requiring the attention of the intelligent farmer are numerous and interesting; and no season should be permitted to arrive without bringing the results of some well-conducted skillful experiment.

If these plain and obviously correct rules had been observed the past year in the the experiments with Guano, instead of loose statements and indefinite opinions, American husbandry would have presented to the world a mass of well authenticated facts and precise agricultural statistics. May another year be crowned with a richer harvest of agricultural knowledge and more abundant stores of agricultural products.

J. W. HARDY.

Randolph, Macon College, Va., Feb. 15, 1846.

NOTE.—Imperial, Scotch and various other acres are referred to in agricultural works.

The English acre, as established by statute in the reign of Henry VIII, is the same with the American acre, and contains 4,840 square yards. With this we compare others.

English acre.....	4,840	square yards.	
Scotch, do.	6,150½	do.	do.
Irish, do.	7,841½	do.	do.
French, (arpent) acre..	6,050	do.	do.
Welch acre.....	9,680	do.	do.
Staffordshire acre.....	10,240	do.	do.

In other counties of England more than 15.000

* The Guano they used was of the same lot with that I received from Dr. Jones.

square acres are included in the acre, 28 feet being the perch or pole instead of 16½.

The varieties of potatoes in Great Britain and Ireland are very numerous. A native of the Emerald Isle has told me he was acquainted with 100 kinds, and Rees mentions more than sixty. The names given them are taken from some property, use or excellences, or from the place where they are grown. Thus, *Connaught Cups* take their name from that part of Ireland called *Connaught*, and from the use sometimes made of them by the peasantry. White and Red *Dons* are white and red *gentlemen*. Berwick Blues and Perth Reds are distinguished by their color and the Scottish towns, Perth, and Berwick.

The titles are sometimes ludicrous—fully expressing the value placed on this root by the lower classes. Thus they have English, Late White and Red Champions; Winter, Late, Red-nose and Pink-nose Kidneys; Irish Apples, Golden Tags, Ox Noble, Poor Man's Profit, Lady Queens, Lords,—and the *gentlemen* before-mentioned—the *Dons*, and the Drunken Landlord.

This root is said to be a native of Peru—the land of Guano, and was first carried to Europe by Sir Walter Raleigh, who on his return from Virginia in 1623, left the seed in Ireland. It may now be called the bread-root of Europe. With the manure from its native country more than 18 tons per imperial acre have been produced in England.

PROSPECTS IN VIRGINIA FOR NEW SETTLERS.

PROPOSED SETTLEMENT OF NEW-JERSEY FARMERS IN THE VICINITY OF PETERSBURG.

To the Editor of the Farmers' Library:

HICKSFORD, Greenville Co. Va. Feb. 12, 1846.

THIS place takes its name from the circumstance of its being a "*fording*" place on the "*Meherrin*" River, and is the seat of government of the county above named. The surrounding country is flat, and the growth of timber is pine and oak. I did not expect so soon to strike the *cotton* region, but that plant constitutes, here at the end of a day's railroad journey from Washington, one of the chief staples of the county; hence it is carried by railroad to the Factories at Petersburg, and the surplus thence to the North, where capital, greater industry and superior intelligence, assisted by the legislation of the country, are levying, and will forever levy contributions on sloth and ignorance. By superior intelligence I do not mean that there are not, in the slaveholding States, men, very many men, of bright and cultivated intellect, excelling in vivacity and force, men of the same relative standing toward the masses, to be found in the North—not at all! When I speak of the superior intelligence of the North, I refer to the *masses*, to the great body of voters, who *prevail at elections and control the legislation and shape the policy of the country!*

Suppose it were possible, by some magic power, to lift up this whole county, and place it in the midst of Pennsylvania, or New-York, or Connecticut, or Massachusetts! Imagination can scarcely conceive a greater transformation than it would undergo, in the course of a few years. The portraits of Hecate and of Hebe present no greater contrast than would the pictures of what it *is* and what it *would be*. The land is naturally good and easily tilled, with a railroad for transportation of produce at the rate of 5 cents a bushel for corn and eight for wheat, with great water power, which in New-England would give employment to many more people than now inhabit this county, all of whom would be *non-producing consumers of agricultural produce.*

Oak wood is cut and brought and delivered in the village for $1 50 per cord, and pine wood is delivered at the railroad dépôt for *seventy-five cents!* You may judge, therefore, of the cost of labor. The land around sells from $1 to $3 or $4 an acre. A gentleman residing here has lately offered 1500 acres within two miles of the railroad for $4 an acre, on one, two and three years' credit, with all necessary buildings, even an ice-house, and a great quantity of wood, and oak and ash timber. River low grounds, that with indifferent cultivation will yield from 40 to 50 bushels of Indian Corn, sells for $12 to $15. Surely it behooves those who are invested with power to rule over the destinies of this naturally glorious region of country, to renounce the miserable blighting spirit of *party*, and to strive with one heart, to discover and banish the moral incubus, whatever that may be, which sheds its withering blight over the face of this land. You would imagine that in a country where houses are going to ruin, where fields once arable and fertile are abandoned to wood, and the wild tenants of the woods coming back to reïnhabit them, you would see every man at work, struggling night and day to resist the progress of dilapidation, as "a brave man struggling with the storms of fate;" but instead of that, it is a rare thing to see a white man laboring systematically at the plow through the whole country.

The taverns and country stores are filled with young men, apparently half educated, and altogether unused to personal labor—not brought up in a fondness for books, and with no means at hand to indulge it, apparently the genteel but impoverished descendants of opulent and honorable ancestors—men of high cultivation and chivalry, with whom these old States so abounded before and at the time of the Revolution.

A difference in estimating the *value of time* seems to constitute the great distinction between Northern and Southern men. Here time seems to press like a burden, and the question is, not how it shall be turned to account, and how much can be made out of it, by the most incessant and sagacious exercise of all our faculties, but how the burden shall be thrown off, or made to sit lighter? For that purpose recourse is had to small gatherings in stores and taverns, and to frivolous amusements. There they soon form the *habit* of smoking and of drinking without at first perceiving the destiny to which they lead, until at last they are caught like the *fly in the spider's web!* Then, alas! when too late, their fate is revealed—their doom is sealed, and there remains no possible means of escape. This is the result of defective education. Be it your duty, then, Mr. Editor, to inculcate upon every farmer's son that nothing is more honorable than *labor*, and nothing so precious as *time*. How much more honorable would it be, to a young man whose family has been reduced from affluence to poverty, to seize the handles of the plow by day, and devote some hours at night to increasing his *store of knowledge* than to be riding about the country, running away from himself and from listlessness! Talk of labor, either of the body or the mind, as degrading or dishonorable! Is it degrading to be able "to adorn the earth and to bring its productive power into action—to apply the material substances of the earth to reasonable use, convenience and ornament—to expand and improve the human mind—to cultivate and strengthen the moral power? No product of the vineyard, the field, or the sea, however aided by inventive art, will furnish a welcome repast to one who sits in listless idleness, on a downy cushion, from breakfast time till dinner. The day laborer who sits down to his coarse meal, has a pleasure to which the listless idler is a stranger."

Virginia can never be regenerated until *these principles are taught in the schools*. Education must have a practical direction. Farmers must force legislators to look less to party objects, and more to the bearing of the laws on the formation of the character and the development of the capacity of the rising generation, for practical purposes. Is it not self-evident that *no idle white population can prosper?* To induce white men to labor, you must cause labor to be esteemed honorable. *The public sentiment must so pronounce it*—that public sentiment is formed by education. "As the twig is bent, the tree's inclined." Moreover, though labor may be esteemed honorable, that is not all: to make it profitable, you must give it *intelligence*. True, the labor of the ox is profitable, but what would it avail if man were not at the handles of the plow? But how much depends on the man's *mind*, whether it be rude and boorish, or spiritual and cultivated? For an illustration of the difference, see the difference between the houses, the tools, implements of war, and the means of conveyance used and enjoyed by the savage and the civilized man. There is something of all this difference in the growth and efficiency observable between the people of different States. In Massachusetts, where the whole mass of the population is educated, and where *not* to labor usefully, and efficiently, and steadily, is deemed *dis*honorable, the land which here is worth $3 an acre, would be worth $100 an acre. Look at the progress of population, and of actual power in the Government as between Virginia and Pennsylvania! In Virginia, education and the circumstances under which they are reared, (which may truly be said to constitute one's education,) lead young men, naturally and without any fault of their own, to be ashamed of personal labor in the fields. In Pennsylvania, a young man who does not labor at something useful loses caste. Well, with these opposite moral systems, these two commonwealths start together in the great race of development and growth, say in 1790—Virginia with her broad territory, her fine climate, her water power, her mines, her numerous and long navigable rivers, her fine scholars, her brilliant orators, her ardent patriots, her gentlemen of truest chivalry, and ladies with their fine silk stockings and charms that would melt the heart of stoicism itself!—And where do we find these two States at the expiration of half a century? They *begin*—Virginia with a population of 748,308, and Pennsylvania with 434,373, and in 50 years they end with, Virginia 1,239,797 and Pennsylvania with 1,724,033—where will they be in half a century more, unless by some more enlightened system of legislation, Virginia should do something to bring her immense resources into play?

These resources are not unknown to the people of other States, but there is obviously something which resists the force of her natural attractions. What is it? *A sign, however, has arisen in the East: New-Jersey farmers*, and what is still better, *Quaker farmers*, are inquiring for lands in Virginia, in the neighborhood of Petersburg, a place which possesses great advantages in its water power and its vicinity to the Chesapeake. The Agricultural Society of Petersburg, animated by a few en-

lightened spirits, have taken the subject in hand. I send you their Report, which it may be well to preserve, as it may, in time to come, form an interesting starting point in the history of an agricultural settlement that could not fail, by the influence of its example, to produce the happiest effects on the agricultural interests of that neighborhood. Who, in fact, can tell the benign results to which these incipient measures may lead?

Let me close this hasty letter by a few lines from one who spoke in parables of wisdom:

"Remember that time is money. He that can earn ten shillings a day by his labor, and goes abroad, or sits idle one-half that day, though he spend but sixpence during that diversion or idleness, ought not to reckon *that* the only expense. He has really spent, or rather thrown away, five shillings besides."

It is but fair to add, that this village and vicinity enjoy the benefit of cultivated society. The presence of such as Dr. Scott, the President of the Senate of this State, O. A. Browne, Merritt, and others who live here and hereabout, would be sufficient to give it that claim and advantage. The owners of land do not sufficiently reflect how much the value of their property, as well as their own enjoyment and the welfare of their families depend on good schools and good society—in a word, on the *reputation of a neighborhood*—for it may have its reputation as well as an individual. If infested with thieves, or what is as bad, made up in good part, of men of licentious and dissipated habits, no matter what may be the fertility of the land or the advantages of markets, or of health, prudent men who are looking about for places to settle themselves or their sons, will eschew such neighborhoods. They may do for what are in the slave States called "quarters," to employ surplus force, but will never attract gentlemen who wish to secure enjoyment and happiness for their families. He remembers the proverb that "*A rotten apple injures its companions.*"

VIATOR.

REPORT IN RELATION TO THE PROBABLE IMMIGRATION INTO LOWER VIRGINIA.

The Committee to which was referred the Resolution of the Petersburg Agricultural Society, adopted on the 27th of December last, in relation to the probable immigration into Lower Virginia of a number of farmers from New-Jersey, offer the following Report:

That they have regarded the subject as well worthy the attention, not only of this Society, but of Lower Virginia at large, whose prosperity could not fail to be promoted by the settlement of industrious Northern farmers within its limits. From the knowledge possessed by the Committee, of the tide-water portion of the State, they believe it to be unsurpassed in natural advantages. The climate is mild and genial, and generally salubrious; the soil is easy of culture, for the most part of good quality and susceptible of rapid improvement, and in many places even of extraordinary fertility, with the means of its restoration, when exhausted, nearly always at hand; the surface of the country is penetrated by a number of large, navigable streams; and the best markets in the Union are accessible with but little inconvenience; the various agricultural products of the Middle States are capable of being grown to the greatest advantage, and all the fruits of our country attain the highest perfection. Throughout this portion of the State, good lands may be bought at the cheapest rates, according to their situation—say from three to ten or fifteen dollars per acre—much less than the prices of lands above tide water, especially in the counties lying along the base of the Blue Ridge, and at a still greater disproportion to the prices of lands farther north.

Your Committee would be rejoiced to be able to offer sufficient inducements in our own immediate section of the State—that is to say, in the counties contiguous to Petersburg—to the consideration of those farmers of New-Jersey who propose to emigrate to Virginia. The Committee have made a number of inquiries, and have heard of many farms, and in some instances of large bodies of lands in Chesterfield, Prince George, Charles City, &c. which would be disposed of by the proprietors on reasonable terms. Some of these lands possess distinguished advantages. The price varies, of course, according to the locality and the state of improvement to which they have been brought; but inconsiderable in every instance, your Committee believe, when compared to their intrinsic value, and to the prices of lands in New-Jersey and Pennsylvania. The Committee have received a particular description of that part of Prince George bordering on the Appomattox River, between Petersburg and City Point, in which its advantages are believed to be by no means overrated. The City Point Railroad on the south side of the river, and the railroad from Port Walthall to Richmond on the opposite side—to say nothing of the river itself—afford facilities for the transportation of all marketable produce almost from the farmers' doors. Your Committee, however, have not deemed it necessary to submit any minute descriptions of the several localities which have been brought to their notice, and conclude by recommending to the meeting the adoption of the following Resolution:

Resolved, That the Agent of the New-Jersey farmers be respectfully invited to call at Petersburg on his visit to Virginia, and that the members of this Society be requested, individually, to offer him the attentions due to a brother farmer, and to render him such aid as may enable him in the best manner to accomplish the object of his mission.

Petersburg, Feb. 6, 1846.

TO MIX PAINTS.—In mixing paints, *observe* that for *out-door work* you must use, principally or wholly, boiled oil, unless it be for the decorative parts of houses, &c.; then mix as for in-door work. For *in-door work* use linseed oil, turpentine, and a little "*driers*," observing that the less oil, the less will be the gloss, and that for "*flatted white*," &c., the color, being ground in oil, will scarcely require any farther addition of that article, as the object is to have it dull. The best "*driers*" are ground litharge and sugar of lead—the former for dark and middle tints, and the latter for light ones.

THE BREAD-FRUIT TREE.

THE earliest account of the Bread-Fruit is by Captain Dampier, in 1688. "The Bread-Fruit," says this navigator, "grows on a large tree, as big and high as our largest apple-trees; it hath a spreading head, full of branches and dark leaves. The fruit grows on the boughs like apples; it is as big as a penny loaf when wheat is at five shillings the bushel; it is of a round shape, and hath a thick, tough rind. When the fruit is ripe it is yellow and soft, and the taste is sweet and pleasant. The natives of Guam use it for bread. They gather it when full-grown, while it is green and hard; then they bake it in an oven which scorcheth the rind, and maketh it black; but they scrape off the outside black crust, and there remains a tender thin crust; and the inside is soft, tender and white, like the crumb of a penny loaf. There is *neither seed nor stone* in the inside, but all of a pure substance, like bread. It must be eaten new, for if it be kept above twenty-four hours, it grows harsh and choky, but it is very pleasant before it is too stale. This fruit lasts in season *eight months* in the year, during which the natives eat no other sort of bread kind. I did never see of this fruit anywhere but here. The natives told us that there is plenty of this fruit growing on the rest of the Ladrone Islands; and I did never hear of it anywhere else."

The scientific men who accompanied Captain Cook in his voyages, came home with the most enthusiastic ideas of the Bread-Fruit. Dr. Solander calls it "the most useful vegetable in the world," and urges that no expense should be spared in its cultivation. The mere idea of bread, the most valuable food of man, growing spontaneously, was doubtless calculated to excite attention—almost, perhaps, as strongly as the subsequent description of the poet:

[Bread-Fruit Tree.]

The Bread-Tree, which, without the plowshare, yields
The unreaped harvest of unfurrowed fields,
And bakes its unadulterated loaves
Without a furnace in unpurchased groves,
And flings off famine from its fertile breast,
A priceless market for the gathering guest. *Byron.*

But, after all, the Bread-Fruit Tree has not, hitherto at least, answered the expectations that were entertained. The Banana is more easily and cheaply cultivated, comes into bearing much sooner after being planted, bears more abundantly, and is better relished by the negroes. The mode of propagating the Bread-Fruit is not, indeed, difficult; for the planter has only to lay bare one of the roots, and mound it

with a spade, and in a short space a shoot comes up which is soon fit for removal.

Europeans are much fonder of the Bread-Fruit than negroes. They consider it as a sort of dainty, and use it either as bread or in puddings. When roasted in the oven, the taste of it resembles that of a potato, but it is not so mealy as a good one. [Penny Magazine.

[Bread-Fruit, Flower and Leaf.]

SUGAR, AND ITS EFFECTS ON MAN AND ANIMALS.

BY JAMES H. FENNELL,
Author of "A Natural History of Quadrupeds," &c.

SUGAR is one of the most ancient productions of India. Its European names, sugar, sucre, &c. are evidently derived from the Sanscrit *sukkhar*, and sugar-candy from *sukkhar-kand*. The cane is most extensively cultivated in the West Indies; and it was not until lately that it was introduced into the East Indies, but it has spread rapidly there, and the climate all over India seems perfectly adapted to it. The canes of the West Indies may be said to be almost wild and primitive, but those of the East Indies are really cultivated, and the great superiority of their Sugar affords an excellent proof of the importance of culture. When the cane had been introduced into Bourbon and Otaheite, the same superiority of the quality and quantity of the crops in comparison with those of the West Indies, on similar extents of ground, or from a like number of canes, was remarkable. Attention being called to this fact, the West India proprietors actually obtained the cultivated canes of Bourbon and Otaheite, and planted them to very great advantage about the close of the last century. In Affghanistan the cane thrives well, and yields an excellent Sugar, but the people are ignorant of the mode of crystalizing it, and therefore they are indebted to Hindostan for their large supplies of sugar-candy. The Affghans cut the fresh cane into small pieces, which they eat as sweetmeats. The cultivation of the cane has lately been introduced into the island of Singapore, and promises to become one of its most important branches of commerce.—Some French capitalists have purchased land at Algiers, on which they are growing it. In Sicily, Spain, and Italy, it was formerly cultivated, but, we believe, its culture is now abandoned in those countries.

Saccharine juice abounds in all the maples; and, in North America, where there are large forests of these trees, a very good sort of Sugar is extensively made from two species, though the black sugar maple is by far the least productive of the two. Pursh tells us that the Americans "obtain the juice by tapping the trees in spring; warm days and frosty nights are most favorable to the plentiful discharge of the sap. A hole is made in the tree in an ascending direction, with an auger, and a spout made of elder is introduced about half an inch, which projects from three to twelve inches. The sap will sometimes flow six weeks, accord-

ing to the temperature of the weather. Troughs are placed under the spouts to receive the sap, which is carried every day to a large receiver, from which it is conveyed, after being strained, to the boiler. Lime, eggs, or new milk are added to the sap, in order to clarify it; but clear Sugar may be made without any of these ingredients. The Sugar, after being sufficiently boiled, is grained, clayed, and refined, in the same manner as the sugar-cane in the West Indies.—The sooner the sap is boiled the better. It should never be kept more than twenty-four hours. The quality of maple sugar is superior to that which is made in the West Indies from the cane, and it deposits less sediment when dissolved in water. It has more the appearance of sugar-candy. The maple-sugar is, in fact, equal to any other Sugar, and is procured with little trouble." In the north of Europe, Sugar has been obtained from other species.

The traveler, Spencer, has given us an account of the Sugar which the Circassians procure from the walnut-trees that flourish in extraordinary perfection on the Caucasian mountains. During spring, just as the sap is rising, they pierce the trunk of the tree, and leave a spigot in it for some time. When the spigot is withdrawn, a clear, sweet liquor exudes, which they allow to coagulate, and sometimes they refine it. They sometimes use, as a substitute for Sugar, clarified honey, that has been perfectly bleached in the sun.

In France, the manufacture of Sugar from chestnuts is going on very promisingly. Some of the proceeds give fourteen per cent. which is above the mean proportion extracted from beet-root.

Professor J. F. W. Johnston says that the saccharine exudation that drops from the *Eucolyptus* of Van Diemen's Land is not a sort of manna as it was supposed to be, but a peculiar kind of sugar, which may be collected in considerable quantity. When crystalized from alcohol, it gave the same composition as grape sugar, but differs from it in relation to heat and other proper ties. The honey-dew, which exudes from limes and other trees, is of a saccharine nature, and Curtis says that if it could be procured in sufficient quantities it would serve well for Sugar. The Abbe Boissier de Sauvages has, indeed, described "a shower of honey-dew," which fell from a lime-tree in the King's garden at Paris. A correspondent of the *Gardener's Gazette* states that he had some bee-hives near a large wood of oak, where there was a honey-dew visible for thirteen successive mornings in August, and that each of these hives produced considerably more honey than those which were farther off.

Sugar has been obtained from the leaves of the ash tree, and from the stems of the birch tree, and of some species of plants.

The American cultivators of maize, or Indian corn, find that by bruising the stalks of this plant while immature, they can express an excellent Sugar. Mr. H. Colman tells us that they have already ascertained that more than 1,000 lbs. weight of sugar can be obtained from a single acre, and he has no doubt that double that amount would eventually be procured by proper cultivation and management, the manufacture being yet in its infancy.

It is well known that Sugar is yielded largely by the roots of carrots and beet. In Russia, there are upward of thirty beet-root Sugar factories in full operation. This manufacture is also thriving in Germany. A few years ago, Messrs. Fies and Slaneward, of Quedlinburg, Westphalia, discovered a process whereby, in twelve hours, ten pounds of pure Sugar, perfectly crystalized, may be extracted from 100 lbs. weight of beet-root. The secret was immediately purchased by M. Brokhoff, of Wisburg, for 20,000 francs, on condition that it should not be used beyond the Rhine and Westphalia. A beet-root sugar manufactory has been established in Essex; and, in 1837, some refined samples of English beet-root Sugar, of good quality and color, were sold in the London market at £5 per cwt. Mr. Rootsey states that forty tons of mangel-wurzel, raised upon a single acre, yielded three tons and a half of molasses.

Sugar extracted from pumpkins is equal in every respect to that from beet-root. Potatoes, wheat, barley, beans and peas, have also been made to contribute to the "sweets of life," and have been found to yield the greatest quantity while immature. A species of *Lamario*, containing a considerable quantity of Sugar, is highly esteemed by the Japanese, as an article of diet, after it has been washed in cold water, and then boiled in milk.

Near the base, and on the upper surface of the ovary, in the flower of the *Rhododendron ponticum* there is a minute glandular spot, whence exudes a thick, clammy juice, which, on desiccation, crystalizes into pure white and transparent sugar-candy, and the crystals, thus naturally formed in the flowers, are sometimes found to be as much as three lines in length, especially in morbid specimens that have withered without fully expanding their petals. It is remarkable that Sugar is yielded in the greatest quantity by plants previous to their attaining perfection, or after they have had their flowers plucked off, or have had their assimilating powers affected by disease or injury. Even in the human being, suffering under certain morbid states, Sugar is found to be secreted by the system. In the *Medico-Chirurgical Transactions*, second series, vol. viii. Dr. Bence Jones has written on Sugar discoverable in the blood of persons laboring under the disease of diabetes, and it is well known to be pretty largely contained in their urine.

In all parts of the globe, mankind evince a fondness for Sugar, which, in many cases, proves wholesome to the constitution. Mr. Montgomery Martin observes that—

> A small quantity of Sugar will sustain life, and enable the animal frame to undergo corporeal and (as I can add from personal experience) mental fatigue better than any other substance. Often have I traveled with the Arab over the burning desert, or with the wild Afric through his romantic country, and, when wearied with fatigue and a noontide sun, we have set ourselves down beneath an umbrageous canopy, and I have shared with my companion his traveling provender—a few small balls of Sugar mixed with spices, and hardened into a paste with flour. Invariably have I found two or three of these balls and a draught of water the best possible restorative, and even a stimulus to renewed exertion. During crop-time in the West Indies, the negroes, although then hard worked, become fat, healthy and cheerful. In Cochin-China, the body-guard of the King are allowed a sum of money daily with which they must buy sugar-canes, and eat a certain quantity thereof, in order to preserve their good looks and *embonpoint*. There are about 500 of these house-

hold troops, and their handsome appearance does honor to their food and to their royal master. Indeed, in Cochin-China, rice and Sugar is the ordinary breakfast of people of all ages and stations; and they not only preserve all their fruits in Sugar, but even the greater part of their leguminous vegetables, gourds, cucumbers, radishes, artichokes, the grain of the lotus, and the thick fleshy leaves of the aloes. I have eaten in India, after a six months' voyage, mutton killed in Leadenhall Market, preserved in a cask of Sugar, and as fresh as the day it was placed in the shambles. In the curing of meat, a portion of Sugar is often mixed with the salt and saltpetre. The Kandyans of Ceylon preserve their venison in earthen pots of honey, and after being thus kept for two or three years its flavor would delight Epicurus himself. In tropical climates, the fresh juice of the cane is the most efficient remedy for various diseases, while its healing virtues are felt when applied to ulcers and sores. Sir John Pringle says the plague was never known to visit any country where Sugar composes a material part of the diet of the inhabitants. Drs. Rush, Cullen, and other eminent physicians, are of opinion that the frequency of malignant fevers of all kinds is lessened by the use of Sugar; in disorders of the breast it forms an excellent demulcent, as also in weakness and acrid defluxions in other parts of the body. Dr. Franklin found great relief from the sickening pain of the stone by drinking half a pint of syrup of coarse brown Sugar before bedtime, which he declared gave as much, if not more relief, than a dose of opium. That dreadful malady, once so prevalent on shipboard, scurvy, has been completely and instantaneously stopped by putting the afflicted on a sugar diet. The diseases arising from worms, to which children are subject, are prevented by the use of Sugar, the love of which seems implanted by Nature in them. As to the unfounded assertion of its injuring the teeth, let those who believe it visit the sugar plantations and look at the negroes and their children, whose teeth are daily employed in the mastication of Sugar, and they will be convinced of the absurdity of the statement.*

Dr. Willis imputed a corrosive quality to Sugar; but in disproof of this notion, Dr. Slare has related, in the *Philosophical Transactions*, No. 337, that his grandfather had, all his lifetime, been in the habit of eating, at his breakfast, a great quantity of Sugar spread upon his bread and butter, and that he used also to put Sugar into his ale and beer, and even into the sauce he ate with his meat. When eighty years of age, he had all his teeth strong and firm, able to crunch the hardest crust, and free from all pain or soreness in his gums. In his eighty-second year one of his teeth dropped out, and, soon after, he lost another, which was one of the front teeth: in fact, all his teeth dropped out in two or three years; but, what is most remarkable, they were replaced by the growth of a perfectly new set. His hair was at that time of a very white color, but it now became much darker. He enjoyed good health and strength, and died in the ninety-ninth year of his age.

The French people are great eaters of Sugar, always carrying some of it about with them in their pockets and reticules, and generally putting five or six large lumps into each cup of coffee.

M. Chossat reports that Sugar, when used as the *exclusive* or *principal* article of diet, produces quite opposite effects in some persons, according to the differences in their system: for, while it fattens some, it creates bile which induces a diarrhœa and a wasting of the solids in other persons. The celebrated Bolivar had, by fatigue and privations, so injured the tone of his stomach, that he was unable at times to take any other food than Sugar, which, in his case, was easy of digestion. His personal friends assure us that in some of his last campaigns he lived for weeks together upon sugar alone as a solid, with pure water as a liquid; but, probably, in nine hundred and ninety-nine cases out of a thousand, this diet would soon have brought the person adopting it to his grave; for, on those whose digestion is feeble, a large or exclusive allowance of Sugar adds to their grievance, because the excess of nutriment, not being generally absorbed by their weakened system, becomes converted to bile, and causes great debility and wasting of the body. In seventeen experiments made on dogs, M. Chossat observed that, when the sugar diet fattened them, there was a general tendency to constipation meanwhile; and, on the contrary, when it produces an excess of bile in other dogs, their bowels were relaxed. Why English children suffer in their digestion after eating largely of sugar-plums, comfits, &c. is chiefly owing, however, to those delicacies being composed of the refuse of starch-works, mixed with plaster of Paris, pipe-clay, or chalk, and having, indeed, as little Sugar as will suffice to give them a palatable sweetness, and they are often colored with gamboge, and sometimes with red lead, verdegris, and other mineral poisons.

Everywhere, the beasts of the field, the birds of the air, the reptiles, fish, and insects, are found to have a great liking for Sugar and honey. Mr. Martin says he has tamed the most savage and vicious horses with Sugar, and has seen the most ferocious animals domesticated by being partly fed upon it. The tamers of lions and tigers owe their power over them chiefly to a judicious use of Sugar and other sorts of sweets, and also of lavender-water, and various other perfumes, of which feline animals are remarkably fond. In the sugar season, in the West Indies, the horses, mules, and cattle soon acquire plumpness and strength by partaking of the leavings of the sugar-canes, after the manufacturer has done with them. In Cochin-China, the elephants, buffaloes, and horses are all fattened with Sugar. We learn from the "Memoirs of Dr. Edward Cartwright," (1843,) that that ingenious man used to fatten sheep on Sugar. To birds this diet proves so nourishing, that the suppliers of the European poultry-markets find that Sugar, along with hemp-seed and boiled wheat, will greatly fatten ruffs and reeves in the space of a fortnight.

[Jour. of Highland and Ag. Soc. of Scotland.

A Profitable Animal.—The celebrated heifer Myrtle, the property of the Duke of Devonshire, was purchased by His Grace at the Royal Agricultural Meeting at Derby, at which meeting she won the first prize of £10 as the best yearling short-horned heifer. The same animal also gained the first prize of £10 at the Yorkshire Agricultural Meeting, at Doncaster, in 1843, as the best yearling heifer; and the first prize of £15 at the Royal Agricultural Meeting at Southampton, in 1844, as the best two-year old heifer. This beautiful animal was never surpassed at any exhibition, and is now only three years and nine months old; she has produced two calves at separate births, for which, together with the dam, 300 guineas have been offered and refused.

[Midland Counties Herald.

* History of the British Colonies, vol. ii.

THE SCIENCE OF BOTANY AND HORTICULTURE;

HOW CULTIVATED IN OTHER COUNTRIES.

THE degree of proficiency in the science of Botany and Horticulture reached by gardeners in Europe, may be judged of by the following.

A Curator to the Botanic Garden at CAMBRIDGE, England, was to be appointed; there were many candidates, all highly recommended. The Trustees wisely determined not to appoint on the mere faith of testimonials, so easily procured in all countries, but to subject the candidates to the test of a rigid examination by Professor HENSLOW. The Professor submitted the following questions, and after the decision was made, he declared that *each* of the candidates justified the testimonials produced in his behalf.

How many are there, gardeners or not gardeners, in this country, this side of the "American Athens," who could answer them? Yet such knowledge might be acquired by *half an hour's* instruction daily, by every boy in our country schools, if conducted by *competent teachers*. But there is our great deficiency: every State ought to have an institution for the *preparation of instructors*. True, this would be expensive, but how expensive, compared with the *many hundred millions of dollars*, which agriculturists have contributed for the support of *military officers and professors?* With the latter, however, are associated the tantalizing ideas of *war* and *glory!* and for these, surely, a sensible, self-taxing people will forego all thoughts of improving the "dull pursuits of civil life," and all that contributes to the fruitfulness of the country and the quiet happiness of the people! "*Oh! we are a glorious nation!*" and landholders of all classes the most zealous, acute and alert in all that concerns their real, true interests!

1st. Write down as many species of the following genera as you may remember to be under culture in England, stating their country, character of the plants, whether trees, &c. description of culture, whether stove, &c. natural order:—Berberis, Nymphæa, Cleome, Althæa, Pistacia, Sempervivum, Lonicera, Eupatorium, Vaccinium, Asclepias, Ajuga, Vitex, Croton, Dorstenia, Neottia, Pancratium, Ruscus, Paspalum, Stipa.

2d. Name a few of the principal genera under culture, in the following orders:—Tiliaceæ, Rutaceæ, Apocyneæ, Scrophularineæ, Coniferæ. Irideæ, Cyperaceæ.

3d. How do you distinguish the following orders from each other:—Papaveraceæ from Nymphæaceæ, Capparideæ from Cruciferæ, Cyperaceæ from Gramineæ?

4th. Point out the difference in the structure of the fruit of the Mulberry, Raspberry, and Strawberry.

5th. Describe the seed-vessels and seeds of the French Bean, Acorn, and Maize.

6th. What are the principal causes of sterility in cultivated plants, and how would you seek to counteract them?

7th. What are the conditions essential to the germination of seeds, and what are the chemical changes effected in them during the process?

8th. Describe the functions of the leaf.

9th. Fill up the imperfect sketch of a design for the new garden, inserting the following particulars:—1st. The houses to range north and south in an open area, in the center of the elliptic herbaceous ground. 2d. Sheds and compost pits to the north between the entrance there, and the north approach to the houses. 3d. Curator's house. 4th. Separate beds for the Grasses, Ferns, and Peat-Plants, away from the herbaceous ground. 5th. Arboretum. 6th. Pond in the north-west angle. 7th. Suggestions respecting the form and arrangements in the houses. 8th. General remarks upon the arrangement of a botanic garden.

THE AMATEUR GARDENER.—There is no pursuit to which man is more evidently led by the hand of his Creator than the cultivation of the ground. Our necessities render the spade and the plow of the first importance to every community, and a high or a low state of Husbandry will always be the distinctive mark of a flourishing or a declining people. In an occupation whose principal capital is industry, and whose object is the supply of our natural wants, the greater number of human beings must always be engaged. With the variations of fashion, and the mutations of ages, other pursuits, once sedulously followed, may become obsolete; but imagination cannot conceive a state of things in which the benignant stores of mother Earth will not be sought after.

The cultivation of the ground, in all its departments, manifests the high honor which is attached to human wisdom and skill by the great Lawgiver of the universe. Nature, wild and untended, will produce luxuriantly the indigenous fruits of the soil, but demands forethought and labor from her dependents, before she yields to them her most valuable riches. By observation, man has improved upon the past. and better methods of cultivation are constantly discovered. Now, in this process of induction, or the Baconian method, as it is called in philosophy, the amateur gardener has employed efforts which have often been crowned with eminent success. Those who till hundreds of acres as the means of subsistance have seldom the courage to perform experiments on a large scale; but the owner of a small garden can do so with pleasure unmingled with the fear of loss. Agriculture has thus been indebted to the lovers of gardening for many discoveries, by which the wealth of nations has been increased, and every amateur, however limited be his domain, may hope to add to the mass of knowledge. If, by the application of manure in some novel manner, or by experiments in hybridizing or crossing, a vegetable may be made more productive, the application of this principle may result in a grand national benefit. I have a great respect

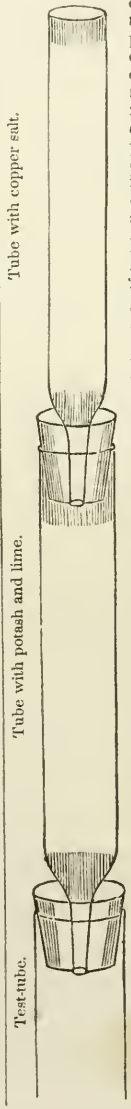
for working gardeners of all grades, for this reason, that they are the silent and modest precursors of those great changes by which the vegetable property of a country acquires an enhanced value. Whether, therefore, you are delighting in an exclusive garden adjoining a country residence, or looking proudly on the beauties of a suburban retreat I thus remind you of a very important argument to be employed in the defence of your pursuits.

But I turn with pleasure from the objects contemplated by the spade and the plow to flowers, those luxuries of Nature, given to reward man for his obedience to the law, "In the sweat of thy brow shalt thou eat thy bread." These emblems of purity and innocence are like the bright eyes which animated the knights of the tournament, calling forth their exertions and rewarding their conquests. The matchless charms of flowers force the attention of the most tasteless of mortals, and win the hearts of the susceptible and refined. A child once said that the stars were little holes pricked in the firmament to let Heaven's glory through; a truthful idea, though linked to a physical error. Apply the same mode of reasoning to flowers, and what can they be but emanations of the beauty and happiness which reside in the mind of an Infinite Being? Their utility is less manifest than their subserviency to the wants of our intellectual nature, since they appeal almost exclusively to what is refined and sentimental and poetic in our constitution. Seed is produced without the accompaniment of a splendid corolla, with its wondrous sanctuary of stamens and pistils, as in the case of all kinds of corn, so that utility is rather associated with that which is plain and unattractive. But the most glorious structures of the floral world belong to plants which, in reference to man's bodily wants, may be called useless. Trade would go on, and fortunes be made, if the world did not possess a Carnation, a Tulip, or a Rose; and yet they are here, winning our attention and riveting the emotions of our hearts. Why are they here? Doubtless to recall us from pursuits carried on in reference to our lower nature, and to lead us to that which is gentle and good. The amateur gardener is thus evidently a respectful observer of the will of Heaven, when he receives these gifts with thankfulness, and bestows on them a portion of his intellectual worship. To think lightly of Floriculture is almost to disparage the wisdom of our Maker, who calls the attention of the child and the man by enameling the earth with the rich colors and lovely forms of these universal favorites. This is a second and convincing argument which you may use in refuting detractors, and justifying yourself. You may not succeed with the former, for some men are destitute of the power of appreciating such reasonings as I have endeavored to unfold. But be contented if you are able to satisfy yourself that in loving your garden you are acting right. Hear what has been written of wild flowers, and be sure that such sentiments are still more appropriate to those who have had something to do in the production of the beauty they admire:

"Oh! chide not at the simple theme that wakes the minstrel's lay; [som by the way:
Earth were less bright without the flowers that blos-
He at whose word the universe her ancient might did yield, [the field.
Hath taught proud man a lesson from the Lilies of
I thank thee, God! for every boon thy hand in mercy showers, [flowers!"
And oh, not least among thy gifts, the beautiful wild

AMMONIA AND WATER IN GUANO.

A Simple Method for Determining the Free and Combined Ammonia and Water in Guano and other Manures.—The want of a simple, accurate, and at the same time expeditious method for determining the amount of Ammonia in Guano has, I think, been felt by most chemists who have been engaged in the analysis of that manure for commercial purposes, where time necessarily becomes a matter of importance; and as the following method, which I have introduced into the laboratory of Dr. G. Wilson, Edinburgh, where several analyses of Guano are daily in progress under my direction, seems to me to possess these advantages, I beg leave to place it before the notice of chemists who may be similarly circumstanced. The quantity of free Ammonia in the Guano is first determined, along with that of the Water, by the following process:—A common test-tube (about 5 inches long and ½ wide) is taken, and in it a determinate quantity of the Guano under examination is placed; from 25 to 50 grs. will be found most convenient. To the test-tube is then joined, by means of a cork, a tube of the same diameter, but only about 4 inches long, having one of its ends contracted and drawn out, so as to pass through the cork and leave a small communicating aperture for the escape of gas from the test-tube.—A few fragments of asbestos are then placed in the contracted end of the tube, to prevent the aperture being choked up during the progress; and the tube is then filled with fragments of caustic potash, either alone or mixed with fragments of lime, which I prefer. To the top of this tube is then joined another tube of precisely similar construction, but being only about 3 inches long, and which, the asbestos being placed as before, is filled with coarsely-pounded sulphate, nitrate, or chloride of copper, previously well dried. A few fragments of asbestos are now placed on the top of each of these tubes, so as to prevent any of their contents falling out. The tubes are then weighed separately. The three tubes are then connected, and the test-tube which contains the Guano is placed in a water-bath until all moisture has been expelled.—The tubes are now disconnected, and again weighed, when the quantity of Ammonia contained in the Guano in a free state is directly determined by the increase of weight which it is found that the tube containing the copper salt has suffered, while the quantity of Water is shown by the increase of weight in the tube containing the potash and lime. The quantity of com-



bined ammonia has now to be ascertained, which is done by adding to the guano contained in the test-tube about an equal bulk of caustic lime in fine powder, and mixing well by agitation; then connecting the apparatus as before, and exposing the test-tube to a low red heat, all the ammonia is expelled and combines with the copper salt contained in the upper tube, and, as before, it is determined by direct weighing. It is very easy to judge when all the ammonia is expelled and when the operation should be concluded, as the ammonia, in combining with the copper salt, gives it, as it proceeds up the the tube, a magnificent blue color, which, when it does not extend any higher up the tube, indicates the conclusion of the operation. In the case of any other manure, where the ammonia has to be found, the operation is precisely similar to the example of guano which I have here taken. I have no doubt that with some modifications, the condensation of ammonia by a salt of copper would be found of use in organic analysis for the determination of the nitrogen; and in one or two cases where I have tried it, the results closely approximated to those obtained by calculation. [D. Forbes, Esq. in the Chem. Gaz.

GENERAL TREATMENT OF GREENHOUSE PLANTS.

The practice of removing Greenhouse Plants into a higher temperature during the period of their growth, so well explained by Mr. Wood in his various communications, cannot be too earnestly recommended. When it is considered that in all the countries where they naturally grow, the summers are intensely hot, with clear sunny days, and heavy dews at night, how much quicker the growth of the plants and ripening of the young wood must be than can possibly happen in our dull, cloudy climate, even with the aid of glass, the universal custom of turning Greenhouse Plants out of doors indiscriminately in the month of May, is doubtless one of the very worst modes of treatment that can possibly be adopted, especially when, as is often the case, they are placed in some shady situation; at this period many are just beginning to grow, others have made some progress, but few or none are within many weeks of terminating their growth and ripening their young shoots, and it is very uncertain whether any of them, under such circumstances, even in the most favorable seasons, will accomplish their growth, consequently when the time arrives for housing, it will be found that three-fourths of them are still in a growing state, and now, when the short, cold, cloudy days have set in, they will continue to grow for weeks, and even months after being brought into the Greenhouse.

This mode of treatment can only end in disappointment; at the time they ought to be loaded with flowers there may certainly be a few solitary blossoms, but anything like a full crop is entirely out of the question. It is remarkable that Camellias appear to be the only family of plants that are rightly treated in this respect; it does not seem to occur to many gardeners that all other hard-wooded Greenhouse Plants require exactly the same treatment as Camellias; but instead of so doing, at the very time the latter are carefully shut up in a higher temperature, to encourage the growth and ripening of the young shoots, as the means of ensuring a fine display of flowers, all, or nearly all, the others are turned out of doors to take their chance of a hot or a cold summer, as the case may be.

When Greenhouse Plants are housed for the winter, then is the time to judge whether they have been rightly treated. If such is the case, they will mostly have finished their growth; the young shoots will have changed from a green to a red or brown color, and of a hard, firm texture, and the flower buds of many swelling out prominently, ready to start into flower with the slightest excitement, rendering the forcing them into flower at any time when required an easy and simple matter. Not only Camellias, but Acacias, Boronias, Azaleas, Epacris, Correæas, and in fact almost every kind of Greenhouse hard-wooded Plant, should be at rest, and ready to start into flower when the proper period arrives. On reading the Reports of the London Horticultural Exhibitions we are often surprised at the large dimensions of many of the plants therein mentioned, especially when we read that many of them are only two or three years old! There cannot be a doubt that this is accomplished by placing them in a strong genial heat, at certain periods, and will serve to show what can be effected in a short time under proper management.

Although the treatment recommended above is applicable to all hard-wooded plants, there are some beautiful things that will not thrive at all unless they are annually placed in a higher temperature to make their growth, and for want of such treatment are rarely seen in good health. Crowea saligna is a striking instance of this neglect, as it is generally seen starving in Greenhouses all the year round; instead of which it should be removed to the plant or pine-stove in January, and allowed to remain till May or June, when it will grow like a willow, making shoots from 8 to 16 inches in length; and when removed to the Greenhouse it will continue to flower all through the summer, a perfect gem, with flowers twice the size we generally see it produce under the ordinary treatment it receives.

As early as the month of January attention should be directed to such plants as have done flowering and are beginning to grow; these should be removed to a higher temperature without delay, and if necessary, it is the best time to shift them into larger pots, and when the young shoots have grown two or three inches in length and taken off with a heel, they will strike root better than at any other time. By attending to the gradual removal of the plants all through the spring months, and when having completed their growth, gradually to harden them for a week or two, and when ready to be placed out of doors for the summer, they may then, with perfect safety, be placed in a shady situation, and remain out as long in the autumn as they may be safe from severe frost. In large establishments a house entirely devoted to this purpose would be very useful; where this is not the case vineries, pine stoves, pits, &c. may all be made available, and without much inconvenience, for this purpose, and even a brick pit without artificial heat, if kept pretty close, would be very useful in forwarding the growth of palms. I have been induced to dwell at some length on the above subject, from a firm conviction that it is not so generally or extensively put in practice as it deserves to be.

Robt. Reid, Noble Thorp.

From the Charleston (S. C.) Mercury.

EFFECTS OF DROUTH ON INDIAN CORN, &c.

TO THE PLANTERS AND FARMERS OF SOUTH CAROLINA.

At the late meeting of the State Agricultural Society, the following Resolution was adopted, viz.:

"That the President be requested to communicate to the public, before the planting season, such information as he may possess, or which it may be in his power to collect, in relation to the means of modifying the effects of drouth on Indian Corn and other provisions."

It is necessary for me to premise, that what I shall say concerning the use of the plow is mainly derivative. From several causes, the planters of the Sea Islands are but slightly acquainted, in practice, with the value of that great agricultural implement. To give the experience of the highest authorities is, therefore, on my part, an imperative obligation. It is proper, also, I should in this place observe that, in consequence of assiduous endeavors to obtain facts from supposed reliable sources, in which I have signally failed, this communication, which would have been made at a much earlier period, has been delayed, but not too late, it is hoped, to be wholly unprofitable.

Satisfactorily to elucidate the matter of the Resolution, would involve a minute examination of many of the topics connected with the science of Husbandry. As I am certain, however, it was not designed or intended that my remarks should take so wide a scope, I shall only briefly advert to those principles and their operation upon which some of the most valuable results in Husbandry rest.

All the earths have a considerable attraction for the fluid which the atmosphere contains. The very best soils possess this power in the highest degree; hence it may with certainty be assumed, that the measure of their fertility depends chiefly on their capacity to absorb moisture. In determining their value, however, on that head, two other properties have to be noticed: the quantity of water which is essential to their saturation, and their power of retaining it. In all these respects, clay and sand occupy antagonistic relations. The former imbibes the aqueous vapors like a sponge and parts with them reluctantly; when dry, it constitutes a compact mass; from the closeness of its texture, the dissolvent action of the air is excluded, by which putrefaction is retarded. The latter is friable and a septic; from the solidity of its particles and their want of coherence, water filters easily. In the adoption of expedients by which to secure these earths a supply of moisture, different processes, in part only, it is advisable to pursue. From their predominance in this State, I shall direct my attention prominently to clayey or aluminous soils. What, then, are the means which reason and experience assure us are the best calculated to attain the end in view? I answer, deep plowing; thorough pulverization of the soil; abundance of manure; and the use of salt and retentive atmospherical absorbents.

1st. *Deep Plowing.*—The roots of plants should be allowed to extend themselves in every direction. The deeper they penetrate, and the wider their ramifications, the greater will be the absorption of nourishment. The average depth of good soils is about 6 inches. Every inch added increases its volume 8 per cent.; so that a soil where the vegetable layer is 12 inches thick, is worth half as much again as that in which it is only 6 inches.* It is consequently obvious that whatever, from this cause, may be its enhanced value, if not reached at some time in the progress of cultivation, the remainder is in effect a *caput mortuum*. By deep plowing the capacity of the whole soil is called forth. While it enables the earth, through the agency of air and water, to inhale atmospheric manure, by diminishing the force of the sun's rays it lessens materially its exhalations. Should the substratum, which perhaps in every instance contains the principles of fertility, be broken, still, as a general proposition, the most signal benefits, prospectively, if not immediately, may confidently be expected to enure from the operation. Deep plowing ensures the greatest product from the smallest given quantity of land. If by the use of one-half of the soil ten bushels of Corn per acre be obtained, it is reasonable to infer, all other circumstances being equal, that were the whole in tilth, twenty bushels would be harvested: indeed a much larger quantity ought to be the result, for the deeper the soil the greater will be the number of stalks, and the larger and more numerous the ears. "The maize," says Taylor, "is a little tree," and possessing roots correspondent to its size, penetrates a depth almost incredible—9 feet, it is known, have been reached. It follows that, where, from the vigor of the plant or the friability of the land, the roots meet with no obstruction, the consequences of drouth will be sensibly diminished, if not entirely prevented. It is believed that the rolling of the leaves of corn is attributable solely to the absence of moisture. This is an error. Scanty manuring or shallow tillage is as often the true cause.

To render deep plowing† effectual, it should take place in autumn. The expansive power of frost, and the mollifying influence of air and rain, and the action of these in breaking the continuity of fibrous matter, are strong reasons in favor of the practice. Whether it should be done once in two or three years only, which, I believe, is the opinion of the most successful farmers of Great Britain, or annually, as is common in parts of our country, certainly as yet an undetermined point.

2d. *Pulverization.*—The soil must not only be made easily accessible to the descent and spread of the roots, but there should be such a disin-

* Thaër's Principles of Agriculture.

† About 12 inches.

tegration of its parts, as to allow the free transmission of air. However rich in ingredients, these afford no nutriment to vegetation, until subjected to the combined action of heat, air, and moisture—the great agents of decomposition. Unless freely supplied with oxygen, the remains of animals and vegetables do not decay, but they undergo putrefaction." "The frequent renewal of air by plowing and the preparation of the soil, change the putrefaction of the organic constituents into a pure process of oxydation; and from the moment at which all the organic matter existing in a soil enters into a state of oxydation or decay, its fertility is enhanced." In a well compounded soil, water is presented to the roots by capillary attraction. As this increases in proportion to the smallness of the particles of earth, the advantage of their complete pulverization is plain. It is equally true, that as food for plants must exist in solution, it is requisite to admit water to the roots by artificially reducing the compactness of the soil by tillage. From frequent working, therefore, the most favorable results may be anticipated; Indeed it has been well observed, that a good stirring of the ground in dry weather is equal to a shower of rain; for however strange it may seem, while it promotes moisture, desiccation is prevented. To aid in the increase and prevention of atmospheric vapor, the rigid system is especially recommended. The breaking up of the old furrows deeply, and making the new ridges on them, by which the two interchange places, provide a quantity of finely divided earth much greater than what is obtained in the ordinary mode. While the coming up of the corn is thereby facilitated, and the thrifty condition of the young plants secured, the depth at which the seeds of grass and weeds are deposited, prevents their germination, except in small numbers; hence labor and time in the culture of the crop are saved. In relation to maize, the author of "Arator" sums up the advantages of high ridges and deep furrows in substance as follows:—The roots are never cut in one direction, and this great depth of tilth thus early obtained, by superseding the occasion for deep plowing in the latter period of its growth, saves them in the other. The preservation of the roots, and their deeper pasture, enable the corn much longer to resist dry weather. Litter thrown into the deep furrow upon which the list is made, is a reservoir of manure, far removed from evaporation; within reach of the roots, which will follow it along the furrow, and calculated to feed the plants when in need of rain. The dead earth brought up by the plow from the deep furrow is deposited on each side of it, without hurting the crop on the ridge; farther, by one deep plowing, received by the corn after it is planted, being bestowed upon it while it is young, and its roots short, and being run nearly a foot from it, the roots of the corn in this way escape injury, and the effects of drouth on the plant being thus lessened, its product is increased.

It would appear from this condensed exposition of his views that, in the opinion of Taylor, one plowing only, and that a deep and early one, the growing crop requires. To clean and pulverize the soil, the harrow, skimmer, or cultivator, alone should be used. Each might advantageously be resorted to in any stage of its growth, but in a parched condition of the earth, their reviviscent tendency would then clearly demand it.

With regard to Sweet Potatoes, the plow may most profitably be employed at any time. When the shoots begin to wither, break up the space between the hills or ridges by running four furrows. The newly turned earth will be found wet in the morning, while before no moisture had been apparent. In a few days the leaves from being brown or yellow will assume a greenish hue, and new shoots ordinarily may be expected to follow.

3d. *Manure.*—The fertility of the soil is the first object to be attained by the farmer. For their dividing properties all fossil manures are highly esteemed. Deep plowing and lime, unaided by organic matter, it is well attested, have renovated lands that, in the judgment of the former proprietors, were not worth the labor of cultivation. In reference to the special matter under consideration, a judicious admixture of soils is of primary importance. Clay applied to sand assists it in retaining manure, and receiving the vaporized water of the atmosphere. To allow the fibres of plants to shoot freely, clay, sand and lime, acting mechanically by their mixture, are mutual manures to each other. Burnt clay may beneficially be substituted for sand.

It has already been observed, that pulverized earth has a strong attraction for atmospheric vapor, and that this increases in proportion to the minuteness into which the particles are divided; but as the power of the most fertile soils, in this respect, is inferior to that of even the worst ordinary manure, it is evident that "for the mere purpose of withstanding long-continued dry weather, those plants whose roots have immediate access to organic manures, will be much better enabled to absorb the necessary supplies of atmospheric moisture, than those merely vegetating in the unmanured soil;" hence, whenever fertilizers are employed in anticipation of drouth, or to mitigate its evils, in either case, the good to flow from their application to Corn will depend in a high degree upon their abundance, and the materials that compose them. The richer the ingredients and larger the quantity, the more decided will be the benefit. Suppose in a propitious season one acre, judiciously manured, to yield 50 bushels and five acres, of the same natural strength, unassisted by art, 10 bushels per acre; experiments and practice prove that in a drouth the former will produce generally not fivefold, but seven or eight times as much as the latter. I may indeed assert, that the difference in product will be commensurate with the heat and dryness of the weather.

Whether manures should be buried deep or shallow, or lie on the surface, and whether they should be spread in a rotted or unrotted state, are questions which the occasion does not require me to investigate. The tendency of decomposing animal and vegetable matter is to rise in the atmosphere; of fossil manures to sink. As it is known that coarse litter is better adapted to corn than any other crop, if employed when putrefaction has commenced, immediately before the period of committing the seed to the ground, or in the fall, in the shape of long muck, to allow the frosts, rain and wind of winter to prepare it for the putrefactive process, every portion of the decaying and fermenting fertilizer will be gradually absorbed by the roots and leaves of the plants. All the facts that have come to my knowledge sustain conclusively the

* Liebig.

principles and reasoning I have advanced. I repeat that very rich ground rarely suffers materially for the want of water especially if it has been properly divided and loosened by artificial means. If, therefore, the withering power of drouth should at any time show itself on poor land, let the farmer instantly apply putrescent manure on the surface of the ridge. To the spreading of compost, without burying it over the cereals during their vegetation, the English attribute an almost magical influence. They assert that "the plants may almost be seen to renovate and regain their verdure." It is evident, says Thaer, that not only actual advantages, but also security against evil, is to be derived from the possession of an active manure of this nature, and without any sensible diminution of its value. Though the quantity may be small, yet the beneficial results first indicated in the change of color in the leaves, will soon appear. In the instance of a planter of this place, whose crop was in a perilous condition from the excessive dryness of the summer of 1844, one cart-load only to the acre of stable manure, partially decomposed, was instrumental in producing a fine yield, while from the remainder of the field the harvest was very meager. When the application was made the corn had begun to tassel; the stalks were small and the leaves yellow and curled. Although the former never increased in size, the latter soon exhibited a healthy green. This favorable indication took place before the first shower of rain, which was slight, and occurred about a fortnight after the trial of the experiment. The secret of my friend's success is traceable to the fact that, as all fertilizers have a strong attraction for atmospheric moisture, he used the one which of all others, in that respect, guano excepted, possesses the greatest power.

A prominent error in Southern Husbandry is over-planting. Manuring, consequently, as a system, is not practiced. This alone is sufficient to account for the smallness of the aggregate crop for the extent of ground annually in tilth. Reformation on this head is therefore loudly demanded. But until this ensue, what is to be done? in what way may the injurious operation of drouth be modified, as well by the ignorant as the skillful, the poor and the rich?

4th. *Salt.*—In small quantities, salt is a septic; in large quantities, it resists putrefaction. Though not strictly germane to the subject entrusted to my charge, I hope I shall be excused for here stating the estimation in which this substance is held by many observant agriculturists. It destroys, they maintain, noxious weeds and vermin; gives luxuriance and verdure to grass lands; prevents the scab in Irish potatoes; sweetens grass, and hastens the maturity of crops. Wheat or barley following turnips on land been previously salted, the ensuing crop, it is well authenticated, escaped the mildew. For a top dressing for grass land, six bushels per acre are recommended; for cleaning the ground, preparatory to the putting in of the grain, sixteen bushels, it is said, may be employed upon fallows. An ounce of salt to a gallon of water benefits vegetables; a larger quantity gives a brown color, and is therefore injurious. As it is a stimulant, salt should be mixed with compost, mud, or loamy earth. Its great capacity for inhaling atmospheric moisture renders it peculiarly valuable in dry and hot weather. For cotton I have used it successfully at the rate of five pecks to the acre. Beyond that, its effects were adverse to the growth and production of the plants. Manure designed for corn, should receive, several weeks before it is put on the land, as much salt as will furnish to every acre not exceeding one and a half bushels. If, however, none of the measures noticed in this communication have been adopted by the farmer, and his crop be suffering from the absence of rain, let him sprinkle on the ridge of each plant or hill as much well pulverized salt as he can conveniently take up with the thumb and two fore fingers. In a short time the result, from my own experience, and that of some of my co-laborers, will be the same as though the ground had been recently moistened with a moderate shower. How long the benefit will continue I am unprepared to state, for amid every experiment of my own, rain fell from ten to fifteen days. I can only assert that, in the interval, the salted portion of the field was in every respect much superior to the remainder.

5th. *Organic Absorbents.*—It is not merely necessary that atmospheric gases should be inhaled by the agents which the vigilant care of the farmer may have provided, but to render his labors and knowledge more effectual, they must possess the additional merit of retaining them. The atmosphere is the matrix of manures; these, however, are so subtle and evanescent, that they quickly escape, unless elaborated into permanency by the use of vegetables in a hardened form. The valuable properties of organic matter in a state of putrefaction, if buried in the earth, are absorbed by plants, and "exactly that portion of manure which is lost by the custom of rotting it before it is employed, becomes the parent of a great crop." The most common and yet the most esteemed retentive atmospheric absorbent with which I am acquainted, is the leaves of the pine.* When mixed with farm-yard or stable manure, especially if a little salt has been added, it forms a highly fertilizing compound. In attracting and preserving the gases and vapor of the atmosphere, lies, however, its great virtue. In a drouth, if applied a few inches thick around each hill of corn, considerable moisture, under the heaps, will be seen in 24 hours, and shortly afterward the field, should the farmer's operations have been so extensive, will prove the efficacy of this simple experiment. At the late session of the Legislature, a member of the Senate informed me, that the last summer he employed pine leaves for his growing crop of potatoes with the happiest results. During the drouth, he filled the alleys with this material. At the time of harvest, potatoes were found on the earth below the trash. Though unable to speak with precision of the difference between this section of his field and that on which no leaves had been placed, yet the product of the one was far greater than that of the other. To determine a question of vegetable reproduction, in 1841, near Brest in France, on a few rods of poor land, untilled and which received no ulterior attention, grains of wheat were strewed, and then covered with wheat straw about an inch thick. In despite of excessive drouths during the spring, prolonged and several times repeated, while all around was drooping and uncertain, the protected wheat sustained no injury. When the plants matured, the straw was found to be "more than

* "Oak leaves," says Thaer, "are not easily decomposed, and contain an astringent matter which is highly injurious to vegetation as long as the leaf remains undecomposed."

6 feet high, and in the ears were 50, 60, and even 80 grains of wheat of full development." A satisfactory explanation of this experiment, remarks a French writer, is found in straw being a bad conductor of heat and a good conductor of electricity. The roots, consequently, were maintained in a medium temperature, and the moisture of the earth, furnished by the straw, facilitated the absorption of carbonic acid from the atmosphere. As pine leaves contain a much greater proportion of nutritive juices, they should always be used, if obtainable, in preference to the straw of other trees or any crop.

Having already extended this communication to an unreasonable length, I will merely add that the true and permanent interest of the agriculturist is to be found in preparing against the vicissitudes of the seasons, and not in weak and uncertain attempts to mitigate their influence. Deep plowing, loosening effectually the texture of the soil, and a bountiful supply of appropriate aliment are the surest means for the accomplishment of that purpose. While a parsimonious use of manure is sure to develop slender returns, it promotes slowly but inevitably the deterioration of the land. It is better, then, to cultivate a few acres to the plow or laborer, furnished abundantly with enriching materials, than treble the number without nutriment. These truths were practically enforced in the palmy days of Egyptian Agriculture. The Roman husbandman was considered blessed who owned seven acres of ground.

In England, twenty or thirty acres constitute a good farm, and in China for one-third of that quantity a large family is well supported. The grass lands in the immediate vicinity of Edinburgh rent for $100 the acre. In West Cambridge, Massachusetts, manure to the value of $100 per acre is supplied by many of the farmers, and instances are not unfrequent of ten acres, thus fertilized, yielding in money $5,000.* To us the full power of land is unknown; indeed, nowhere has it been ascertained that there is a limit to production. The period, perhaps, has arrived, when not only the advancement of their pecuniary welfare, but it may be, the preservation of the domestic institutions of the South depends on a radical change in the habits and practices of the tillers of its soil. If, in relation to this State, the distressing visitation of the last summer have the effect of arousing the attention of our agriculturists to the necessity of union among themselves, with a view to a free and full interchange of opinions in matters pertaining to their common vocation; they may yet have ample cause to be grateful to a merciful Providence for the calamity with which they have so recently and heavily been afflicted.

WHITEMARSH B. SEABROOK,
Pres. State Ag. Soc. of So. Ca.

* Farmer's Register.

PHILADELPHIA BUTTER:

ITS HIGH FLAVOR AND THE SOURCE WHENCE THIS IS DERIVED.

To the Editor of the Farmers' Library:

My Dear Sir: During one of your late visits to Philadelphia, we had some conversation relative to the rare qualities of Philadelphia Butter, which, though good at all times, is at one season distinguished by a peculiarly high and delightful flavor not to be found in the same degree, so far as I can learn, in Butter made in any other part of the Union. I told you that I thought I had discovered the source of this peculiarly grateful flavor, and now undertake to redeem a promise made to write you on the subject.

In the first place, I wish you to bear in mind that the original settlers in the old counties adjacent to Philadelphia were chiefly from Wales, and hence may claim a legitimate right to excel in the processes of the dairy. They took up their abodes among the hills, and as indispensable appendages of their farm houses, built what they call "Spring Houses," over the natural fountains flowing out of the hill-sides. These are shaded by wide-spreading trees tending to preserve the coolness imparted by the water surrounding the vessels containing the milk, cream, and other dairy products. A temperature is thus secured for the cream established by experiments as the most favorable to the perfect operation of churning, namely, the range from 50° to 65°—beginning with the cream at or near the first-named degree, and terminating the process with the temperature at 65°. It is only after the butter has "come," that warm water is to be added so as to raise the warmth to 70° or 75°. This is to facilitate the separation of the Butter from the milk. No one who has ever visited Pennsylvania Spring-Houses and observed the coolness and cleanliness they usually display, can doubt the great advantages afforded by them for dairy purposes.

But, though these circumstances may serve to improve the general qualities of Philadelphia Butter, still they are by no means concerned in producing that delightful flavor, the immediate cause of which is the main point to which I now wish to call your attention. As before intimated, it is only at one season that the flavor is in greatest perfection, and hence our housekeepers call it "May Butter," and sometimes "Grass Butter." The limits of the season of highest flavor may be set from about the middle of April to the middle of June. Now it is precisely during this time that the old, unplowed meadows and pasture fields in the vicinity of Philadelphia abound with a species of grass so highly odoriferous as to have

obtained the name of *Sweet-scented Vernal Grass*. Botanists call it *Anthoxanthum odoratum*. The scent somewhat resembles that of vanilla. It grows about a foot or eighteen inches high, rising above the surrounding grass. Its stem is very small and round, with a few long and slender leaves. Its odor will alone be sufficient to distinguish it from all other grasses found in our pastures. When in blossom, the air is often highly charged with its scent, and at this time I seldom ride into the country without gathering a handful of the grass to enjoy its rich perfumes at leisure, and perhaps store it away in a drawer. As it is so very forward in its growth, so does it show the earliest signs of decay. About the middle of June the fields and meadows where it abounds assume a yellowish appearance from the dying of the stems of the first growth. The cattle press these aside to get at greener herbage, and now the high flavor of our Butter declines.

The Sweet-scented Vernal Grass is a native of Europe, whence it has doubtless been introduced into the vicinity of Philadelphia, blended probably with other grass seeds. It has long become naturalized, and now occurs among other spontaneous herbage, disputing the right of soil with the common green grass, and never yielding possession till turned under by the plow, after which it clings to the unbroken fence and head-rows. Though seldom, if ever regularly sown here, it constitutes a part of the growth of most English pastures, thriving in nearly every kind of soil. The sweet odor for which English meadow hay is so noted, comes from the admixture of this grass. It is, however, seldom, if ever sown by itself, but usually mixes with the seeds of other grasses adapted to the formation of permanent pastures. It ranks rather low on account of nutritious properties, but is principally esteemed for its early growth, and continuing to throw up fresh shoots till the end of autumn. Indeed, the aftermath, or second growth, is particularly prized for grazing purposes.

A chemical examination of the Sweet-scented Vernal Grass shows that while its nutritious properties are less than those of most other grasses, it is distinguished from these by containing *benzoic acid*, or *flowers of benzoin*, a substance possessing a peculiarly agreeable aromatic odor. An essential oil in which this resides can be distilled from the grass, affording a pleasant perfume. It is undoubtedly this aromatic ingredient that imparts to the milky secretion of the cow the flavor so pleasantly manifested in Philadelphia Spring-Grass Butter. When we find milk so readily imbued with the peculiar flavors of garlic, turnips and other substances upon which cows often feed, there can be no room to doubt that a fragrant grass freely eaten by cows should likewise impart its particular flavor to the milky secretion.

If this very simple solution of the cause of the high flavor of Philadelphia Spring Butter be true—and I have not the least doubt upon the subject, you can at once perceive that a pasture grass may be introduced almost every where, which will communicate an exquisite flavor to Butter.

In London, Epping and Cambridge Butter are both greatly extolled for their high and delicate flavor. The cows producing the former, which is most esteemed, graze during summer in the wild pastures of Epping Forest, and the high flavor of their Butter has been commonly ascribed to the wild shrubs, plants, and leaves of trees which they feed upon. The Cambridge Butter is also produced from cows that graze upon natural pastures, one part of the year on uplands, and the other in rich meadows. As the Sweet-scented Vernal Grass is common to the natural pastures of England, I doubt not it may be found most abundant in those of Epping, Cambridge and other places most celebrated for high-flavored Butter. So far as I can find by inquiry and research in English books, the particular grass which contributes the greater part, if not all the fine high flavor to the best and most costly Butter, has never, as yet been identified. Without such exact knowledge this flavor of Butter must necessarily remain beyond the control of the agriculturist, wherever Nature or accident has not provided the pastures with the aromatic agent.

I remain very respectfully yours, &c.
G. EMERSON.

PLOWING.—I think I may say that in England and Scotland the art of plowing has reached perfection, and that it is unrivaled and unsurpassable. This, at least, is my opinion, which must be taken at what it is worth. I cannot conceive how it can be improved; and this not in rare instances, and at plowing matches, but I may say universally. In some cases, the work has been done better than in others; but I have not seen an example of bad plowing in the country; I have not seen one which, in the United States, would not be pronounced superior.

A ruffle from under a crimping-iron does not present a more beautiful object than a well-plowed field from under the hands of an English or a Scotch artist. The lines are all straight; the furrows well turned; the headlands cross-plowed; the corners finished. A well-disciplined mind enjoys the highest pleasure from seeing an operation of any kind, even the most humble, well performed, and perfected according to its proper measure.

There is something, likewise, extremely gratifying in witnessing the progress and advancement of human skill and art. From digging the ground with a stick, that a hole might be made for the deposit of the seed, to the perfect inversion of it by the plow, what an immense stride!

[Colman's European Agriculture.

hair*pointing upward, are longer and wider than those in the preceding Order; the one on the right not so long as the other.

Eighth Order.—These Cows, while at the hight of their flow, yield *three litres* a day, and continue to give milk until they have conceived anew.

The escutcheon is still defined, but on a very small scale. If the marks of upward growing hair (F F) at the sides of the vulva exist at all, they consist of a few bristling hairs, projecting crosswise.

COW OF MEDIUM HIGHT.

First Order.—Cows of this Order, while at the hight of their flow, yield *fourteen litres* a day, and continue to give milk until they are eight months gone with calf.

Second Order.—These Cows yield *twelve litres* a day, and continue to give milk until they are seven months gone with calf.

Third Order.—These Cows yield *ten litres* a day, and continue to give milk until six months gone with calf.

Fourth Order.—These Cows yield *eight litres* a day, and continue to give milk until five months gone with calf.

Fifth Order.—These Cows yield *six litres* a day, and continue to give milk milk until they are four months gone with calf.

Sixth Order.—These Cows yield *four litres* a day, and continue to give milk until three months gone with calf.

Seventh Order.—These Cows yield *three litres* a day, and cease to give milk upon being got with calf.

Eighth Order.—These Cows yield still less, and go dry upon conceiving anew.

LOW COW.

First Order.—These Cows yield, while at the hight of their flow, *eleven litres* a day; and continue to give milk until they are eight months gone with calf.

Second Order.—These Cows yield *nine litres* a day, and continue to give milk until seven months gone with calf.

Third Order.—These Cows yield *seven litres* a day, and continue to give milk until six months gone with calf.

Fourth Order.—These Cows yield *five litres* a day, and continue to give milk until five months gone with calf.

Fifth Order.—These Cows yield *four litres* a day, and continue to give milk until four months gone with calf.

Sixth Order.—These Cows yield *three litres* a day, and continue to give milk until two and a half months gone with calf.

Seventh Order.—These Cows yield *two litres* a day, and their yield goes on diminishing until they conceive anew; at which time they go dry.

Eighth Order.—These Cows yield still less, and go dry at the same period.

BASTARD OF THE BICORN COW.

The marks F F possess the same properties for indicating the Bastards of this Fourth Class, as in regard to those of the Third. (See Plate IX. Fig. 5.)

CLASS V.

The Demijohn Cow.

This name indicates the shape of the escutcheon of this class. It may strike the reader as queer; but it is significant, and serves to recall the figure of the characteristic mark of the Class, which very much resembles the outline of a demijohn. If my discovery is a useful one, habit will soon accustom people to this name, as well as to the others of my Eight Classes; and to those who may feel disposed to find fault with them, I will say, what matters it to you? the name is as nothing, the importance is altogether in the thing.

HIGH COW.

First Order.—Cows of this Order and Size, while at the hight of their flow, yield *sixteen litres* a day, and continue to give milk until they are eight months gone with calf.

The skin within the escutcheon has the same yellowish color as in the higher Orders of the preceding Classes. The udder is delicate, and covered with fine, downy hair. The escutcheon, consisting of a growth of ascending hair, begins between the four teats, and on the inner side of the legs, above the hock joint; as it extends upward it spreads upon the outer surface of the thighs to the points A A. (Plate V. Fig. 1.) From these points, the figure is bounded by right lines, to the points J J, which are distant from each other from five to six inches. From these points, the upward growing hair rises to the line N, where it is from two and a half to three and a quarter inches in width. This line is directly below the vulva, and distant from it about four inches. The wider the figure is at this place, and the nearer it approaches to the vulva, the better the Cow.

Above the hind teats are two ovals (E E), formed by descending hair, about four inches long, by nearly three inches in width. On the right and left of the vulva are two streaks of ascending hair (O O), nearly two and a half inches long, by less than half an inch in widih. The hair within these streaks is fine and short, and very distinct from the dascending hair that surrounds them.

Second Order.—These Cows yield, while at the hight of their flow, *fourteen litres* a day, and continue to give milk until they are seven months gone with calf.

The escutcheon differs from that of the First Order in being on a smaller scale. Above the teats there is but one oval (E), to the right, formed by descending hair. Of the two streaks of ascending hair (O O) alongside of the vulva, the one to the left is of the same dimensions as in the First Order; but the one to the right, although of the same width, is of but half the length.

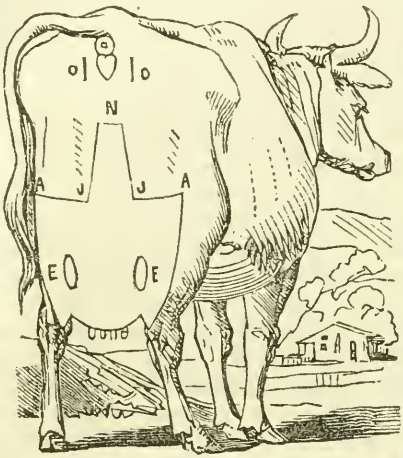
Third Order.—These Cows, while at the hight of their flow, yield *twelve litres* a day, and continue to give milk until they are six months gone with calf.

The escutcheon, preserving its general shape, is yet more contracted. At the points A A, it is more rounded off, and no longer spreads on the outer surface of the thighs. Above the points J J, it is narrower; and it stops short at N, considerably lower down beneath the vulva. There is but one of the streaks (O) of ascending hair, which is to the left of the vulva, and about an inch and a half long, by two-fifths of an inch in width.

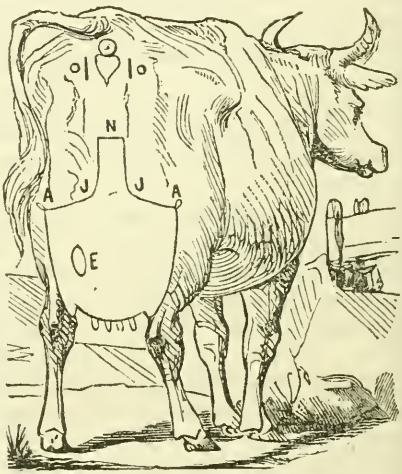
TABLE V.....CLASS 5.

The Demijohn Cow.

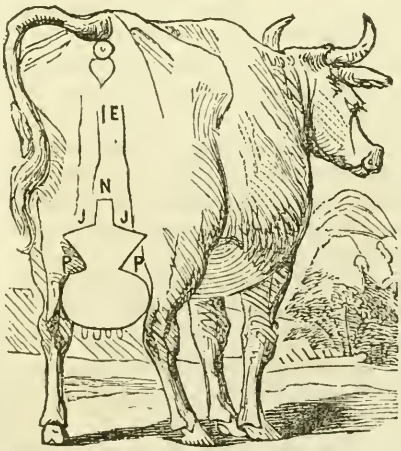
Order 1st.



Order 2d.



Order 5th.



Order 6th.

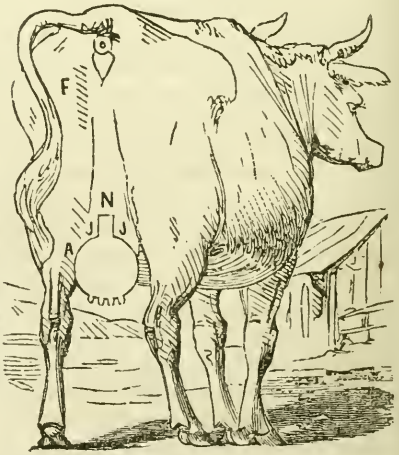
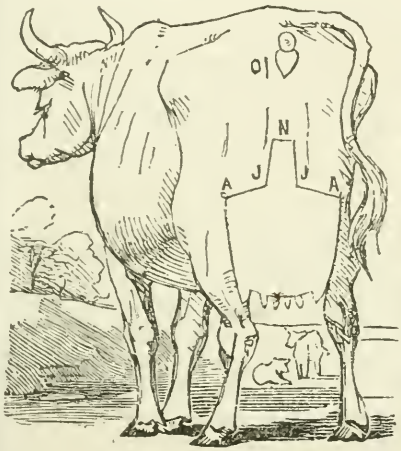


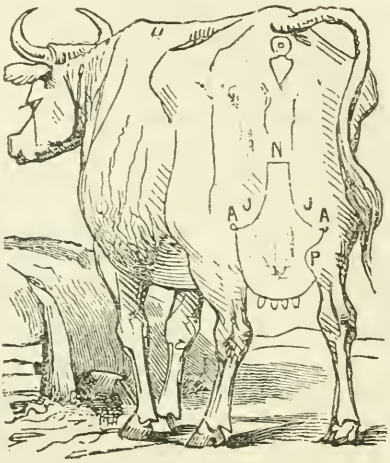
TABLE V.....CLASS 5.

The Demijohn Cow.

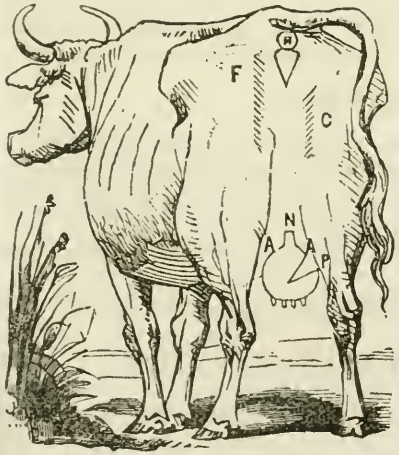
Order 3d.



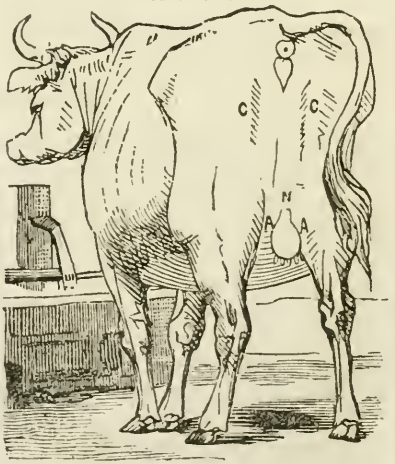
Order 4th.



Order 7th.



Order 8th.



FOURTH ORDER.—These Cows, while at the hight of their flow, yield *ten litres* a day, and continue to give milk until they are five months gone with calf.

The escutcheon is yet more reduced in size. The points A A lower down and nearer together. The lines are more curved at the points J J, and the distance from these points to N is much less. Below A, on the right side, there is a failure of the upward growing hair, marked P.

FIFTH ORDER.—These Cows, while at the hight of their flow, yield *eight litres* a day, and continue to give milk until they are four months gone with calf.

The escutcheon goes on contracting in size. The points A A, being now on the inner surface of the thighs, are no longer so apparent. The upper extremity N is much farther below the vulva. At both points A A there is a failure of the ascending hair (P P), where its place is occupied by descending hair, running into the escutcheon. These marks are about five inches deep, by four in width.

Below the vulva there is a small streak of ascending hair (E), about an inch and a quarter long, by less than half an inch wide.

SIXTH ORDER.—These Cows, while at the hight of their flow, yield *six litres* a day, and continue to give milk until they are three months gone with calf.

The escutcheon is on a still more contracted scale than in the preceding Order. Near the vulva, to the left, there is a streak of ascending hair (F), which bristles up. It is nearly five inches long, by about one and a half in width.

SEVENTH ORDER.—These Cows, while at the hight of their flow, yield *four litres* a day, and continue to give milk until they are two months gone with calf.

The escutcheon is smaller and lower down than in the preceding Order. On the right and left of the vulva are two streaks of ascending hair, which bristles up. The one on the left (F) is somewhat longer than that found in the Sixth Order; the one on the right (C) is about four inches long, by an inch and a half in width. Below the point A, on the right hand, there is a failure of the ascending hair (P).

EIGHTH ORDER.—These Cows, while at the hight of their flow, yield *two litres* a day, and continue to give milk until they have conceived anew.

The escutcheon is hid away between the thighs; the points A A scarcely perceptible. The streaks of bristling hair (C C) on the right and left of the vulva are of the kind indicative of the degeneracy and bad quality of the Cow.

COW OF MEDIUM HIGHT.

FIRST ORDER.—These Cows, while at the hight of their flow, yield *fourteen litres* a day, and continue to give milk until they are eight months gone with calf.

SECOND ORDER.—These Cows yield *twelve litres* a day, and continue to give milk until they are seven months gone with calf.

THIRD ORDER.—These Cows yield *ten litres* a day, and continue to give milk until six months gone with calf.

FOURTH ORDER.—These Cows yield *eight litres* a day, and continue to give milk until five months gone with calf.

FIFTH ORDER.—These Cows yield *six litres* a day, and continue to give milk until four months gone with calf.

SIXTH ORDER.—These Cows yield *five litres* a day, and continue to give milk until three months gone with calf.

SEVENTH ORDER.—These Cows yield *three litres* a day, and continue to give milk until two months gone with calf.

EIGHTH ORDER.—These Cows yield still less, and go dry upon being got with calf.

LOW COW.

First Order.—These Cows, while at the hight of their flow, yield *ten litres* a day, and continue to give milk until they are eight months gone with calf.

Second Order.—These Cows yield *eight litres* a day, and continue to give milk until seven months gone with calf.

Third Order.—These Cows yield *six and a half litres* a day, and continue to give milk until six months gone with calf.

Fourth Order.—These Cows yield *five litres* a day, and continue to give milk until five months gone with calf.

Fifth Order.—These Cows yield *four litres* a day, and continue to give milk until four months gone with calf.

Sixth Order.—These Cows yield *three litres* a day, and continue to give milk until three months gone with calf.

Seventh Order.—These Cows yield *two litres* a day, and continue to give milk until two months gone with calf.

Eighth Order.—These Cows yield *one litre* of milk a day, and go dry upon conceiving anew.

BASTARD OF THE DEMIJOHN COW.

When the streaks marked F F are found in the Cow of this Class, of the dimensions specified in the description of the Bastard of the *Curveline* Cow, they serve here also to detect the Bastard Cow; and her badness in regard to the rapid loss of her milk will be in proportion to the size of these streaks. The smaller they are, the less defective will she be in this respect. (See Plate IX. Fig. 6.)

CLASS VI.

The Square-Scutcheon Cow.

The name indicates the appearance of the escutcheon, the upper part of which is shaped like a carpenter's or mason's square.

HIGH COW.

First Order.—Cows of this Order and Size yield, while at the hight of their flow, *sixteen litres* a day, and they continue to give milk until they are eight months gone with calf.

The skin within the escutcheon is of the same yellowish color as in the superior Orders of the preceding Classes. The udder delicate, covered with short, fine hair. The escutcheon begins as in the foregoing Classes; and, rising from just above the hock joint, on the inner surface of the thighs, spreads outward to the points A A. (See Plate VI. Order 1.) Above those points it represents a square. A right line runs across to the points J J, distant from each other from five to six inches. Thence the figure is bounded by two right lines, which meet in an acute angle at the point E, distant about two inches from the vulva. Above that, to the left, the figure of a square is formed by two streaks of hair, E B and B C (the point C being at the orifice of the vagina); the former of which is about four inches long, by an inch and a quarter wide, and the latter from five to six inches long, by somewhat less than the same width.

Above the hindmost teats are two small oval marks (G G), formed by downward growing hair in the field of ascending hair. They are about five or six inches long, by two and a half wide. The hair within them is of a lighter color than that without.

The nearer the escutcheon approaches to the vulva, the better the Cow.

Second Order.—These Cows yield, while at the hight of their flow, *fourteen litres* a day, and continue to give milk until they are seven months gone with calf.

The escutcheon is the same as in the First Order, only somewhat reduced in size. The square figure near the vulva commences lower down, and is longer than the one just described. There is but one oval above the teats, to the left (G), of the same size as those in the First Order.

Third Order.—These Cows, while at the hight of their flow, yield *twelve litres* a day, and continue to give milk until they are six months gone with calf.

The escutcheon is the same in its general shape, but it is more contracted in all its parts, and does not extend so high up. The points A A are nearer to the inner surface of the thighs; and the escutcheon is narrower at the points J J, where the outline has acquired a curved character.

The angular space between J J and E is narrower than the streak E B, and shorter than B C. The latter is wider and longer than in the preceding Order.

Fourth Order.—These Cows yield, while at the hight of their flow, *ten litres* a day, and continue to give milk until they are five months gone with calf.

The escutcheon is still more reduced in size. To the right of the vulva there is a streak of bristling hair, growing upward (F), about four inches long, by one and a half wide. Below the point A, to the right, there is a space (U) where the upward growing hair fails, and is replaced by descending hair.

Fifth Order.—These Cows, while at the hight of their flow, yield *eight litres* a day, and continue to give milk until they are four months gone with calf.

The unfavorable marks are the same as in the preceding Order, only more conspicuous and on a larger scale.

Sixth Order.—These Cows, while at the hight of their flow, yield *six litres* a day, and continue to give milk until they are three months gone with calf.

The escutcheon is yet more contracted, confined to the inner surface of the thighs, and more distant from the vulva. To the right and left of this orifice are streaks or lines of ascending hair, coarse and bristling.

Seventh Order.—These Cows, while at the hight of their flow, yield *four litres* a day, and continue to give milk until they are two months gone with calf.

The escutcheon is smaller still. The streak of ascending hair (F) on the right is wider, and the hair more bristling.

Eighth Order.—These Cows yield, while at the hight of their flow, *two litres* a day, and go dry upon being got with calf.

The shape of the escutcheon is still perceptible; but it is very small, and hid away between the thighs.

COW OF MEDIUM HIGHT.

First Order.—These Cows, while at the hight of their flow, yield from *twelve* to *thirteen litres* a day, and they continue to give milk until they are eight months gone with calf.

Second Order.—These Cows yield *ten litres* a day, and continue to give milk until seven months gone with calf.

THIRD ORDER.—These Cows yield *eight litres* a day, and continue to give milk until six months gone with calf.

FOURTH ORDER.—These Cows yield *six litres* a day, and continue to give milk until five months gone with calf.

FIFTH ORDER.—These Cows yield *four and a half litres* a day, and continue to give milk until four months gone with calf.

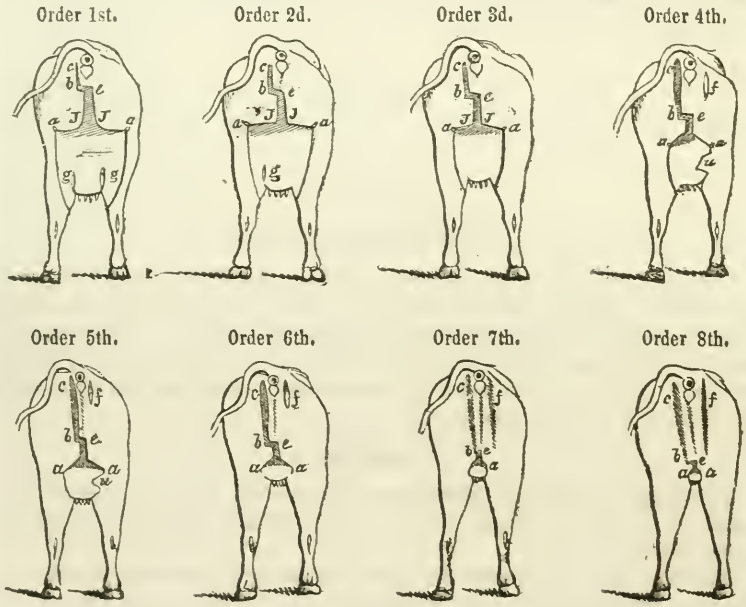
SIXTH ORDER.—These Cows yield *three and a half litres* a day, and continue to give milk until three months gone with calf.

SEVENTH ORDER.—These Cows yield *two litres* a day, and continue to give milk until one month and a half advanced in gestation.

EIGHTH ORDER.—These Cows yield still less, and go dry upon being got with calf.

TABLE VI.....CLASS 6.

The Square-Scutcheon Cow.



LOW COW.

FIRST ORDER.—Cows of this Order and Size yield, while at the hight of their flow, *nine litres* a day; and they continue to give milk until they are eight months gone with calf.

SECOND ORDER.—These Cows yield *eight litres* a day, and continue to give milk until seven months gone with calf.

THIRD ORDER.—These Cows yield *six litres* a day, and continue to give milk until six months gone with calf.

FOURTH ORDER.—These Cows yield *four and a half litres* a day, and continue to give milk until five months gone with calf.

FIFTH ORDER.—These Cows yield *three and a half litres* a day, and continue to give milk until four months gone with calf.

SIXTH ORDER.—These Cows yield *two and a half litres* a day, and continue to give milk until three months gone with calf.

SEVENTH ORDER.—These Cows yield *one litre* a day, and continue to give milk until a month and a half advanced in gestation.

EIGHTH ORDER.—These Cows yield still less, and go dry upon being got with calf.

BASTARD OF THE SQUARE-SCUTCHEON COW.

When the streak (O) of ascending hair on the right of the vulva consists of coarse, bristling hair, this indicates a Bastard. She will lose her milk the more promptly in proportion to the size of this growth of bristling hair, to the coarseness of the hair, and to the degree in which it bristles up and projects over; but, wherever this sign exists, the Cow will lose her milk, more or less gradually, a short time after being impregnated. The indication of this will be the more positive if the streaks above described as forming the square, to the left of the vulva, also consist of coarse, bristling hair.

CLASS VII.

The Limousine Cow.

The first Cow of this Class which came under my notice was from the Province whose name I have adopted as that of the Class. It is not to be inferred, however, that none but the Cows of Limousin belong to the Class. Its characteristic mark is to be found in all the different breeds. The name is a purely arbitrary one; and, in adopting it, I acted in the same spirit that influenced me in calling my First Class the *Flanders* Cow.

HIGH COW.

FIRST ORDER.—Cows of this Order and Size, while at the hight of their flow, yield *fourteen litres* a day, and continue to give milk until they are eight months gone with calf.

The skin, within the escutcheon formed by the growth of ascending hair, is of the same yellowish color as in the nigher Orders of the preceding Classes. The udder is delicate, and covered with short, fine, and silky hair. The growth of ascending hair begins between the teats, and on the inner side of the legs, above the hock joint, spreading outwardly, as it rises, to the points A A (see Plate VII. Order 1), on the outer surface of the thighs. From these points the escutcheon is bounded by two right lines, which run slanting downward to the points J J, which are about four inches apart. From these points two right lines rise to the point O, somewhat less than three inches below the vulva, where they meet in an acute angle.

To the right and left of the vulva are two small streaks of ascending hair (C C), about three inches or less in length, by two-fifths of an inch in width. Above the hind teats are two ovals of descending hair (G G), about four inches long,

by two and a half inches in width. They are very distinguishable, by means of the whitish color of the hair within them.

These streaks, to the right and left of the vulva, do not always occur in Cows of the First Order; and they are not, therefore, to be considered as an indispensable part of the characteristic marks of this Order. The escutcheon itself, even, is sometimes imperfectly defined, and yet the Cow proves herself to be of the First Order.

Second Order.—These Cows, while at the hight of their flow, yield *twelve litres* a day, and continue to give milk until they are seven months gone with calf.

The characteristic marks are the same as in the First Order; the escutcheon, however, being on a smaller scale. The streaks (C C) to the right and left of the vulva are shorter and wider.

Third Order.—These Cows, while at the hight of their flow, yield *ten litres* a day, and continue to give milk until they are six months gone with calf.

The escutcheon is the same in shape, but more contracted. The streak (C) the vulva, to the left, is nearly five inches long, by upward of an inch in width. On the right of the vulva is a small patch of ascending hair (E), nearly three inches long, by upward of an inch in width. The point O is about six inches distant from the vulva.

Fourth Order.—These Cows, while at the hight of their flow, yield *eight litres* a day, and continue to give milk until five months gone with calf.

The escutcheon is on a still smaller scale. There is but one streak (C) of ascending hair by the vulva, on the left, which is eight inches long, by something over an inch in width.

Fifth Order.—These Cows, while at the hight of their flow, yield *six and a half litres* a day, and continue to give milk until they are four months gone with calf.

The escutcheon is smaller, lower down, and confined to the interior surface of the thighs. If any streaks of ascending hair occur, on the right and left of the vulva, they consist of bristling hair, and are longer and wider than in the preceding Order.

Sixth Order.—These Cows, during the hight of their flow, yield *five litres* a day, and continue to give milk until they are three months gone with calf.

The escutcheon preserves its shape, but is still more contracted in its dimensions. The point O is lower down. On the left of the vulva is a streak of bristling hair, growing upward (F).

Seventh Order.—These Cows, while at the hight of their flow, yield *four litres* a day, and continue to give milk until they are one month gone with calf.

The escutcheon is smaller still. The streaks of ascending hair (F F) on the right and left of the vulva are wider, by about an inch, than those above described, and the hair is coarse and bristling.

Eighth Order.—These Cows, while at the hight of their flow, yield *two litres* a day, and go dry upon being got with calf.

The escutcheon is so small, and hid away between the thighs, as to be barely perceptible. The streaks of ascending hair (F F) are still longer and wider than in the Seventh Order.

COW OF MEDIUM HIGHT.

First Order.—The Cows of this Order and Size, while at the hight of their flow, yield *eleven litres* a day, and continue to give milk until they are eight months gone with calf.

SECOND ORDER.—These Cows yield *nine litres* a day, and continue to give milk until seven months gone with calf.

THIRD ORDER.—These Cows yield *seven and a half litres* a day, and continue to give milk until six months gone with calf.

FOURTH ORDER.—These Cows yield *five and a half litres* a day, and continue to give milk until five months gone with calf.

FIFTH ORDER.—These Cows yield *four litres* a day, and continue to give milk until four months gone with calf.

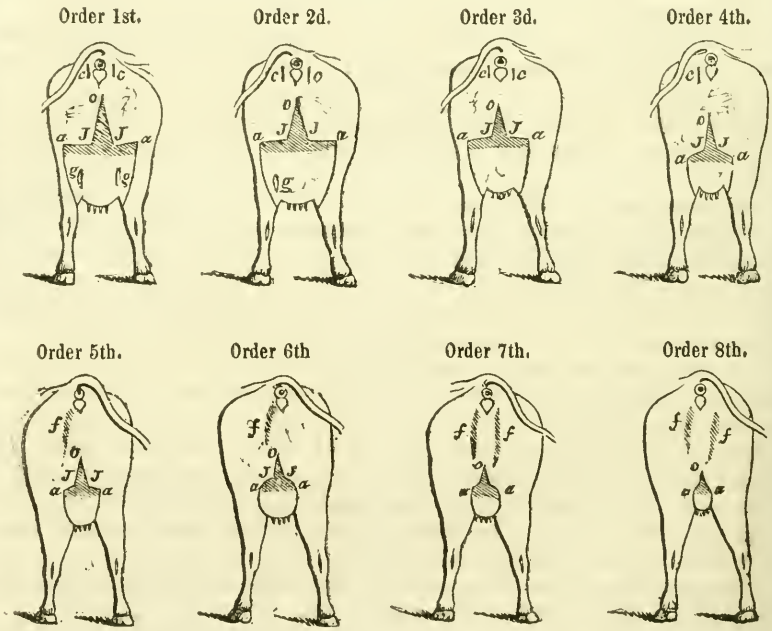
SIXTH ORDER.—These Cows yield *three litres* a day, and continue to give milk until three months gone with calf.

SEVENTH ORDER.—These Cows yield *two litres* a day, and continue to give milk until two months gone with calf.

EIGHTH ORDER.—These Cows also yield *two litres* a day, and go dry upon being got with calf.

TABLE VII.....CLASS 7.

The Limousine Cow.



LOW COW.

FIRST ORDER.—The Cows of this Order and Size yield, while at the hight of their flow, *eight litres* a day, and continue to give milk until eight months gone with calf.

SECOND ORDER.—These Cows yield *seven litres* a day, and continue to give milk until seven months gone with calf.

Third Order.—These Cows yield *six litres* a day, and continue to give milk until six months gone with calf.

Fourth Order.—These Cows yield *five litres* a day, and continue to give milk until five months gone with calf.

Fifth Order.—These Cows yield *four litres* a day, and continue to give milk until four months gone with calf.

Sixth Order.—These Cows yield *three litres* a day, and continue to give milk until three months gone with calf.

Seventh Order.—These Cows yield *two litres* a day, and continue to give milk until one month gone with calf.

Eighth Order.—These Cows yield *one litre* a day, and go dry upon being got with calf.

BASTARD OF THE LIMOUSINE COW.

In this Class also, as in the *Curveline* and *Bicorn* Classes, the Bastard is indicated by the streaks of ascending hair (F F) to the right and left of the vulva; which streaks are of the same dimensions and of the same character generally as in those Classes. (See Plate IX. Fig. 8.)

CLASS VIII.

The Horizontal Cut Cow.

I have given this name to those Cows whose escutcheon is bounded at top by a horizontal line, which cuts the ascending hair square off just when it has spread to its greatest width, The figure (Plate VIII.) will be seen to be very different from that of the other Classes.

HIGH COW.

First Order.—The Cows of this Order and Size, during the hight of their flow, yield *twelve litres* a day, and they continue to give milk until they are eight months gone with calf.

The skin within the escutcheon, and the dandruf from it, are of a reddish yellow. The ascending hair is short and fine; the skin beneath it quite silky; the four teats far apart. As in the other Classes, the ascending hair which forms the escutcheon begins between the four teats, and on the inner surface of the thighs, a little above the hock joint—spreading out, as it rises, to the points E E, on the outer surface of the thighs. Here it is cut short off, by a transversal or horizontal line, running across from one thigh to the other.

Although the escutcheon does not rise, as in the other Classes, to or near the vulva, we nevertheless find, on the right and left of that orifice, the two streaks of ascending hair (C C), which are so valuable, as an indication of the character of the Cow, in regard to the period during which she will continue to give milk after becoming pregnant: this point being determined by the size of these marks and the nature of the hair within them. In the present Order they consist of fine hair, and are from three and a quarter to four inches in length, by less than half an inch broad.

Above the hind teats are two little oval marks (B B), consisting of downward growing hair, distinguishable by its whitish color as well as by the direction in which it points.

Second Order.—These Cows, while at the hight of their flow, yield *ten litres* a day, and continue to give milk until they are seven months gone with calf.

The escutcheon is the same in shape as that of the First Order, but contracted in its dimensions. The streaks (C C) on the right and left of the vulva are unequal in size—the one on the left being of the same length as in the First Order, while the one on the right is considerably shorter.

In several of the Orders there is, immediately under the vulva, and touching it, a small streak of ascending hair (N), about two inches in length, by less than half an inch in breadth.

Third Order.—These Cows, while at the hight of their flow, yield *eight litres* a day, and continue to give milk until they are six months gone with calf.

The escutcheon is the same in shape, but more contracted still; the points E E are lower down and nearer together. Alongside of the vulva there is but one streak of ascending hair (G), which bristles up and projects over. This mark is from five to six inches long, by from four-fifths to six-fifths of an inch in width.

On the inner surface of the right thigh, beginning at the point A, there is a failure of the upward growing hair, which is replaced by descending hair. This downward growth of hair is wedge-shaped, pointing toward the udder; it is about eight inches long, by four inches in width. The hair is very distinguishable by its whitish color.

Although I have taken this place to make it known, this mark does not always occur in Cows of this Order, nor is it peculiar to those of the present Class.—Whenever it is found, let the Cow be of whatever Class or Order she may, it indicates that her daily yield of milk will fall about one-third short of the quantity set down as proper to a Cow of that Class and Order.

Fourth Order.—These Cows, while at the hight of their flow, yield *six litres* a day, and continue to give milk until they are four and a half months gone with calf.

The escutcheon is smaller and lower down than in the Third Order. There is but one streak (N) of upward growing hair, which is betwixt the thighs, in a line with the vulva, and about two or two and a half inches from it. It is about four inches long, by four-fifths of an inch in breadth. Within the escutcheon there are two failures (A A) of the upward growing hair, like the one above described—that on the right being larger than the other.

Fifth Order.—These Cows, while at the hight of their flow, yield *five litres* a day, and continue to give milk until they are three and a half months gone with calf.

The escutcheon is smaller still, and lower down. On the left of the vulva there is a streak (F) of upward growing hair, coarse and bristling. This mark is about six inches long, by an inch and a half in width.

It is to be observed, in regard to the streaks alongside of the vulva, that when they occur in a Cow of an inferior Order, such as they are described to be in the Cow of the First Order; in this case, whatever may be the inferiority of the Cow as to the quantity of her daily yield, she will continue to give her milk just as a Cow of the First Order would. That is to say, she will be just as long in going dry, after being got with calf, as a Cow of the First Order.

Sixth Order.—These Cows, while at the hight of their flow, yield *four litres* a day, and continue to give milk until they are two months gone with calf.

The escutcheon is smaller, lower down, and confined to the inner surface of the thighs. The longer and broader the streaks of ascending hair (F F) on the

right and left of the vulva, and the coarser and more bristling the hair, the worse the Cow will prove in regard to the time she will continue to give milk after being got with calf.

SEVENTH ORDER.—These Cows, while at the hight of their flow, yield *three litres* a day, and continue to give milk until one month gone with calf.

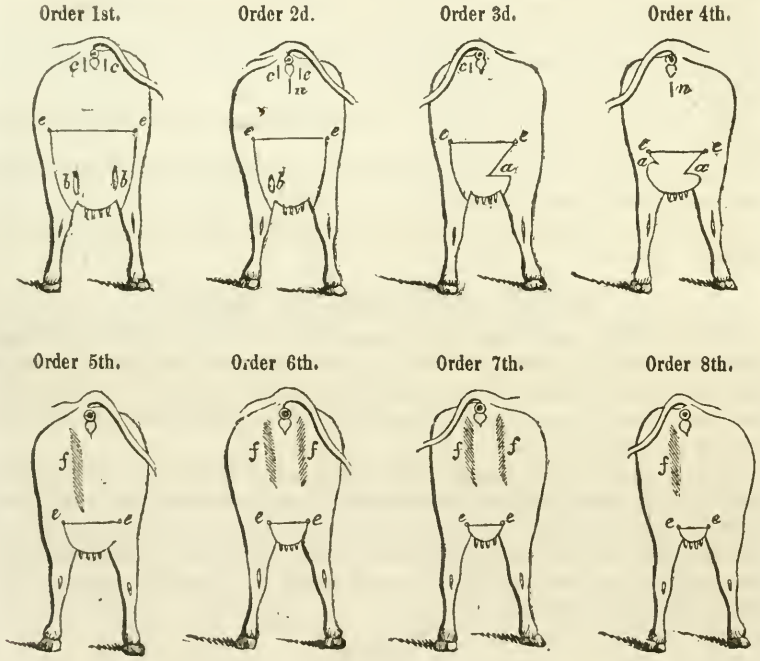
The escutcheon is still smaller than the last. The signs (F) of early drying up are the same as in the foregoing Order.

EIGHTH ORDER.—These Cows yield, during the hight of their flow, *two litres* a day, and go dry upon being got with calf.

The escutcheon is so hid away between the thighs as to be barely perceptible. Some coarse bristling hairs (F), which grow awry, are seen pointing toward the vulva.

TABLE VIII.....CLASS 8.

The Horizontal Cut Cow.



COW OF MEDIUM HIGHT.

FIRST ORDER.—These Cows yield, while at the hight of their flow, *nine litres* a day, and continue to give milk until they are eight months gone with calf.

SECOND ORDER.—These Cows yield *eight litres* a day, and continue to give milk until seven months gone with calf.

THIRD ORDER.—These Cows yield *seven litres* a day, and continue to give milk until five months gone with calf.

Fourth Order.—These Cows yield *six litres* a day, and continue to give milk until four months gone with calf.

Fifth Order.—These Cows yield *five litres* a day, and continue to give milk until three months gone with calf.

Sixth Order.—These Cows yield *four litres* a day, and continue to give milk until two months gone with calf.

Seventh Order.—These Cows yield *three litres* a day, and continue to give milk until one month gone with calf.

Eighth Order.—These Cows yield *two litres* a day, and cease to give milk upon being got with calf.

LOW COW.

First Order.—The Cows of this Order and Size, while at the hight of their flow, yield *six litres* a day, and continue to give milk until they are eight months gone with calf.

Second Order.—These Cows yield *five litres* a day, and continue to give milk until seven months gone with calf.

Third Order.—These Cows yield *four litres* a day, and continue to give milk until five months gone with calf.

Fourth Order.—These Cows yield *three litres* a day, and continue to give milk until four months gone with calf.

Fifth Order.—These Cows yield *two litres* a day, and continue to give milk until three months gone with calf.

Sixth Order.—These Cows yield *one litre* a day, and continue to give milk until two months gone with calf.

Seventh and Eighth Orders.—These Cows yield still less, and go dry upon being got with calf.

BASTARD OF THE HORIZONTAL CUT COW.

The Bastards of this Class have no escutcheon whatever. The entire space from the vulva to the udder, and on the inner surface of the thighs, is covered with hair growing downward; no growth of ascending hair is to be found upon the parts where the escutcheon occurs in the other Classes, and in the Genuine Cow of this Class.

Some of these Bastards are excellent milkers, so long as they are not impregnated; but so soon as they are got with calf, or a very short time afterward, they go dry. Those in whom the hair on the inner surface of the thighs is thick and very fine, will be found to give good rich milk. The reverse holds in regard to the quality of the milk yielded by those in whom these parts are covered with a scanty growth of coarse hair.

BASTARD BULLS.

Having attached to the portion of the work appropriated to each Class a description of the Bastard Cow belonging to it, I must indicate here the signs by which a Bastard Bull is to be known.

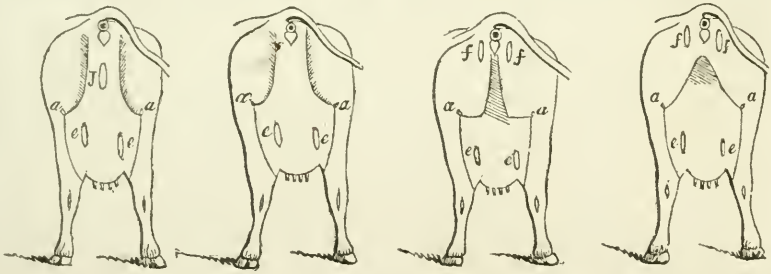
Bulls have escutcheons of the same shapes as those of the Cows; only, as I have already said, on a smaller scale. The growth of ascending hair which forms the escutcheon extends from the testicles upward, spreading on the inner

side of the thighs. Now, whenever streaks of descending hair occur in this field of ascending hair, giving rise to lines of bristling hairs, this is to be looked upon as an indication of imperfection or bastardy; and the indication will be certain, in proportion to the size and extent of these blemishes in the escutcheon. Those Bulls in which they do not occur, and whose escutcheons, at the same time that they are free from these streaks, ascend high up, and are well developed and defined; every such Bull is to be deemed genuine, and may be relied upon for the reproduction of animals of the highest order.

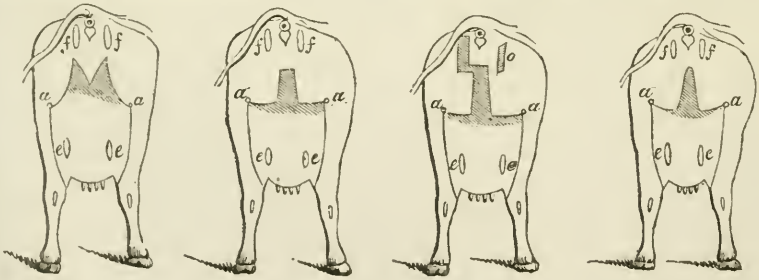
TABLE IX.

The Bastard Cow of the several Classes.

1st Class. Bastard Flanders Cow. **1st Class.** Bastard Flanders Cow. **2d Class.** Bastard Selvage Cow. **3d Class.** Bastard Curveline Cow.



4th Class. Bastard Bicorn Cow. **5th Class.** Bastard Demijohn Cow. **6th Class.** Bast'd Sq. Scutch. Cow. **7th Class.** Bast. Limousine Cow.



TABLE

SHOWING THE YIELD OF THE SEVERAL ORDERS OF EACH CLASS.

Class.	Ord. I.	II.	III.	IV.	V.	VI.	VII.	VIII.	Litres.	Qts.	Gills.
1. Flanders Cow.											
High	20	18	16	14	12	9	6	4	20	21	2
Medium	16	14	12	10	8	5	3	2			
Low	12	10	8	6	4	3	2	1	18	19	1
2. Selvage Cow.											
High	18	16	14	12	10	8	6	4	16	17	0
Medium	14	13	11	10	8	6	4	3			
Low	10	8	6	4	3	2	2	1	15	15	7½
3. Curveline Cow.											
High	18	16	14	12	10	7	5	3	14	14	7
Medium	18	13	11	9	7	5½	3½	2			
Low	12	10	8	6	5	4	3	2	13	13	6½
4. Bicorn Cow.											
High	16	14	12	10	8	6	4	3	12	12	6
Medium	14	12	10	8	6	4	3	2½			
Low	11	9	7	5	4	3	2	1½	11	11	5½
5. Demijohn Cow.											
High	16	14	12	10	8	6	4	2	10	10	5
Medium	14	12	10	8	6	5	3	2			
Low	10	8	6¼	5	4	3	2	1	9	9	4¼
6. Square-Scutcheon Cow.											
High	16	14	12	10	8	6	4	2	8	8	4
Medium	12	10	8	6	4½	3½	2	1½			
Low	9	8	6	4½	3½	2½	1	½	7	7	3½
7. Limousine Cow.											
High	14	12	10	8	6½	5	4	2	6	6	3
Medium	11	9	7¼	5½	4	3	2	2			
Low	8	7	6	5	4	3	2	1	5	5	2½
8. Horizontal Cut Cow.											
High	12	10	8	6	5	4	3	2	4	4	2
Medium	9	8	7	6	5	4	3	2			
Low	6	5	4	3	2	1	less than 1		3	3	1½

LABOR AND MACHINERY.

The effects of improved machinery should be to alleviate and to shorten human toil, and, in multiplying production, to supply more widely the supply of food, and the common comforts of life. The laboring man should, on every principle, be the first to share in these benefits; but far too often he is the last. Food is greatly multiplied both in quantity and variety; but in a country where labor is superabundant, the wages of labor become proportionately reduced, and the power to purchase restricted. There can be no doubt that, in respect to clothing and furniture, the condition of the laboring population is greatly improved above what it formerly was. An American clock, for example, made in Connecticut—that home of industry and the useful arts—an article both useful and ornamental, and in which the "gude" housewife is sure to take an honest pride, may be purchased in London for a pound. A century ago this would have been an article of furniture which a nobleman might covet.

But it is too true that improved machinery scarcely diminishes—in many cases it increases—the demand for human and brute labor. Two men only are required to thresh grain with a flail; from five to eight, besides the horses, or the attendants upon the steam engine, are employed at the threshing-machine. Much more is threshed, and, in consequence of these increased facilities, much more is grown, and therefore requires to be threshed. "But for the invention of the steam-engine, a large proportion of the coal mines now profitably worked could not have been opened, or must have been abandoned. It is well known that, by the consumption of one bushel of coals in the furnace of a steam-boiler, a power is produced which, in a few minutes, will raise 20,000 gallons of water from a depth of 350 feet—an effect which could not be produced in a shorter time than a whole day through the continuous labor of twenty men, working with the common pump. By thus expending a few pence, an amount of human labor is set free, to employ which would have cost fifty shillings; and yet this circumstance, so far from having diminished the demand for human labor, even in the actual trade where the economy is produced, has certainly caused a much greater number of persons to be employed in coal-mining than could otherwise have been set to work."

[Colman's European Agriculture.

From a Treatise in the "Store of Knowledge."

THE DISEASES OF THE HORSE.

BY WILLIAM YOUATT.

The principal diseases of the Horse are connected with the circulatory system. From the state of habitual excitement in which the animal is kept, in order to enable him to execute his task, the heart and the blood-vessels will often act too impetuously; the vital fluid will be hurried along too rapidly, either through the frame generally, or some particular part of it, and there will be *congestion*, accumulation of blood in that part, or *inflammation*, either local or general, disturbing the functions of some organ, or of the whole frame.

Congestion.—Take a young Horse on his first entrance into the stables; feed him somewhat highly, and what is the consequence? He has swellings of the legs, or inflammation of the joints, or perhaps of the lungs. Take a horse that has lived somewhat above his work, and gallop him to the top of his speed; his nervous system becomes highly excited; the heart beats with fearful rapidity; the blood is pumped into the lungs faster than they can discharge it; the pulmonary vessels become gorged, fatigued, and utterly powerless—the blood, arrested in its course, becomes viscid, and death speedily ensues. We have but one chance of saving our patient—the instantaneous and copious abstraction of blood; and only one means of preventing the recurrence of this dangerous state, namely, not suffering too great an accumulation of the sanguineous fluid by over-feeding, and by regular and systematic exercise, which will inure the circulatory vessels to prompt and efficient action when they are suddenly called upon to exert themselves. The cause and the remedy are sufficiently plain.

Again, the brain has functions of the most important nature to discharge, and more blood flows through it than through any other portion of the frame of equal bulk. In order to prevent this organ from being oppressed by a too great determination of blood to it, the vessels, although numerous, are small, and pursue a very circuitous and winding course. If a horse highly fed, and full of blood, is suddenly and sharply exercised, the course of the blood is accelerated in every direction, and to the brain among other parts. The vessels that ramify on its surface or penetrate its substance are completely distended and gorged with it. Perhaps they are ruptured, and the effused blood presses upon the brain; it presses upon the origins of the nerves on which sensation and motion depend, and the animal suddenly drops powerless. A prompt and copious abstraction of blood, or, in other words, a diminution of this pressure, can alone save the patient. Here is the nature, the cause, and the treatment of *apoplexy*.

Sometimes this disease assumes a different form. The horse has not been performing more than his ordinary work, or perhaps he may not have been out of the stable. He is found with his head drooping and his vision impaired. He is staggering about. He falls, and lies half unconscious, or he struggles violently and dangerously. There is the same congestion of blood in the head, the same pressure on the nervous origins, but produced by a different cause. He has been accustomed habitually to overload his stomach, or he was, on the previous day, kept too long from his food, and then he fell ravenously upon it, and ate until his stomach was completely distended and unable to propel forward its accumulated contents. Thus distended, its blood-vessels are compressed, and the circulation through them is impeded or altogether suspended. The blood is still forced on by the heart, and driven in accumulated quantity to other organs, and to the brain among the rest; and there congestion takes place, as just described, and the animal becomes sleepy, unconscious, and, if he is not speedily relieved, he dies. This too is apoplexy; the horseman calls it *stomach staggers*. Its cause is improper feeding. The division of the hours of labor, and the introduction of the *nose-bag*, have much diminished the frequency of its occurrence. The remedies are plain,—bleeding, physicing, and the removal of the contents of the stomach by means of a pump contrived for that purpose.

Congestions of other kinds occasionally present themselves. It is no uncommon thing for the blood to loiter in the complicated vessels of the *liver*, until the covering of that viscus has burst, and an accumulation of coagulated black blood has presented itself. This congestion constitutes the *swelled legs* to which so many horses are subject when they stand too long idle in the stable, and it is the source of many of the accumulations of serous fluid in various parts of the body, and particularly in the chest, the abdomen, and the brain.

Inflammation is opposed to *congestion*, as consisting in an active state of the capillary arterial vessels; the blood rushes through them with far greater rapidity than in health, from the excited state of the nervous system by which they are supplied.

Inflammation is either *local* or *diffused*. It is confined to one organ, or to a particular portion of that organ; or it involves many neighboring ones, or it is spread over the whole frame. In the latter case it assumes the name of *fever*. Fever is general or constitutional inflammation, and is said to be *sympathetic* or *symptomatic* when it can be traced to some local affection or cause, and *idiopathic* when we cannot so trace it. The truth probably is, that every fever has its local cause, but we have not a sufficient knowledge of the animal economy to discover that cause.

Inflammation may be considered with reference to the membranes which it attacks.

The *mucous membranes* line all the cavities that communicate with the external surface of the body. There is frequent inflammation of

the membrane of the mouth. *Blain*, or *Glossanthrax*, is a vesicular enlargement which runs along the side of the tongue. Its cause is unknown. It should be lanced freely and deeply, and some aperient medicine administered.—*Barbs*, or *paps*, are smaller enlargements, found more in the neighborhood of the bridle of the tongue. They should never be touched with any instrument; a little cooling medicine will generally remove them. *Lampas* is inflammation of the palate, or enlargement of the bars of the palate. The roof of the mouth may be slightly lanced, or a little aperient medicine administered: but the sensibility of the mouth should never be destroyed by the application of the heated iron. *Canker* and *wounds in the mouth* from various causes, will be best remedied by diluted tincture of myrrh, or a weak solution of alum.

Foreign bodies in the gullet may generally be removed by means of the probang used in the hoove of cattle; or the œsophagus may be opened, and the obstructing body taken out.

It is on the mucous membranes that *poisons* principally exert their influence. The *yew* is the most frequent vegetable poison. The horse may be saved by timely recourse to equal parts of vinegar and water injected into the stomach, after the poison has been as much as possible removed by means of the stomach-pump. For arsenic or corrosive sublimate there is rarely any antidote.

Spasmodic colic is too frequently produced by exposure to cold, or the drinking of cold water, or the use of too much green meat. The horse should be walked about, strong friction used over the belly, and spirit of turpentine given in doses of two ounces, with an ounce each of laudanum and spirit of nitrous ether, in warm water or ale. If the spasm is not soon relieved the animal should be bled, an aloetic ball administered, and injections of warm water with a solution of aloes thrown up. This spasmodic action of the bowels, when long continued, is liable to produce *introsusception*, or *entanglement*, of them, and the case is then hopeless.

Superpurgation often follows the administration of a too strong or improper dose of physic. The torture which it produces will be evident by the agonized expression of the countenance, and the frequent looking at the flanks. Plenty of thin starch or arrow-root should be given both by the mouth and by injection; and, twelve hours having passed without relief being experienced, chalk, catechu, and opium should be added to the gruel.

Worms in the intestines are not often productive of much mischief, except they exist in very great quantities. Small doses of emetic tartar with a little ginger may be given to the horse half an hour before his first meal, in order to expel the round white worm; and injections of linseed-oil or aloes will usually remove the ascarides, or needle-worms.

The *respiratory passages* are all lined by the mucous membrane. *Catarrh*, or *cold*, inflammation of the upper air passages, should never be long neglected. A few mashes or a little medicine will usually remove it. If it is neglected, and occasionally in defiance of all treatment, it will degenerate into other diseases. The larynx may become the principal seat of inflammation. *Laryngitis* will be shown by extreme difficulty of breathing, accompanied by a strange roaring noise, and an evident enlargement and great tenderness of the larynx when felt externally. The windpipe must be opened in such case, and the best advice will be necessary. Sometimes the subdivisions of the trachea, before or when it first enters the lungs, will be the part affected, and we have *bronchitis*. This is characterized by a quick and hard breathing, and a peculiar wheezing sound, with the coughing up of mucus. Here, too, decisive measures must be adopted, and a skillful practitioner employed. His assistance is equally necessary in *distemper*, *influenza*, and *epidemic catarrh*, names indicating varieties of the same disease, and the product of atmospheric influence; differing to a certain degree in every season, but in all characterized by intense inflammation of the mucous surfaces, and rapid and utter prostration of strength, and in all demanding the abatement of that inflammation, and yet little expenditure of vital power.

Cough may degenerate into *inflammation of the lungs*; or this fearful malady may be developed without a single premonitory symptom, and prove fatal in twenty-four or even in twelve hours. It is mostly characterized by deathly coldness of the extremities, expansion of the nostril, redness of its lining membrane, singularly anxious countenance, constant gazing at the flank, and an unwillingness to move. A successful treatment of such a case can be founded only on the most prompt and fearless and decisive measures. The lancet should be freely used. Counter-irritants should follow as soon as the violence of the disease is in the slightest degree abated; sedatives must succeed to them, and fortunate will he be who often saves his patient after all the decisive symptoms of pneumonia are once developed.

Among the consequences of these severe affections of the lungs are *chronic cough*, not always much diminishing the usefulness of the horse, but strangely aggravated at times by any fresh accession of catarrh, and too often degenerating into *thick wind* which always materially interferes with the speed of the horse, and in a great proportion of cases terminates in broken wind. It is rare indeed that either of these diseases admits of cure. That obstruction in some part of the respiratory canal, which varies in almost every horse, and produces the peculiar sound termed *roaring*, is also rarely removed.

Glanders, the most destructive of all diseases to which the horse is exposed, is the consequence of breathing the atmosphere of foul and vitiated stables. It is the winding up of almost every other disease, and in every stage it is most contagious. Its most prominent symptoms are a small but constant discharge of sticky matter from the nose; an enlargement and induration of the glands beneath and within the lower jaw, on one or both sides, and, before the termination of the disease, chancrous inflammation of the nostril on the same side with the enlarged gland. Its contagiousness should never be forgotten, for if a glandered horse is once introduced into a stable, almost every inhabitant of that stable will, sooner or later, become infected and die.

The urinary and genital organs are also lined by mucous membranes. The horse is subject to *inflammation of the kidneys* from eating musty oats or mowburnt hay, or from exposure to cold and injuries of the loins. Bleeding, physic, and counter irritants over the region of the loins should be had recourse to. *Diabetes*, or *profuse staling*, is difficult to treat. The inflammation

that may exist should first be subdued; and then opium, catechu, and the uva ursi administered. *Inflammation of the bladder* will be best alleviated by mucilaginous drinks of almost any kind. *Inflammation of the neck of the bladder*, evinced by the frequent and painful discharge of small quantities of urine, will yield only to the abstraction of blood and the exhibition of opium. A catheter may be easily passed into the bladder of the mare, and the urine evacuated, but it will require a skillful veterinary surgeon to effect this in the horse. *A stone in the bladder* is readily detected by the practitioner, and may be extracted with comparative ease. The sheath of the penis is often diseased from the presence of corrosive mucous matter. This may easily be removed with warm soap and water.

To the mucous membranes belong the conjunctival tunic of the eye, and the diseases of the eye generally may be here considered. A *scabby itchiness* on the edge of the eyelid may be cured by a diluted nitrated ointment of mercury. *Warts* should be cut off with the scissors, and the roots touched with lunar caustic. *Inflammation of the haw* should be abated by the employment of cooling lotions, but that useful defence of the eye should never, if possible, be removed. Common *ophthalmia* will yield as readily to cooling applications as inflammation of the same organ in any other animal; but there is another species of inflammation, commencing in the same way as the first, and for a while apparently yielding to treatment, but which changes from eye to eye, and returns again and again, until blindness is produced in one or both organs of vision. The most frequent cause is hereditary predisposition. The reader cannot be too often reminded that the qualities of the sire, good or bad, descend, and scarcely changed, to his offspring. How *moon-blindness* was first produced no one knows; but its continuance in our stables is to be traced to this cause principally, or almost alone, and it pursues its course until cataract is produced, for which there is no remedy. *Gutta serena* (palsy of the optic nerve) is sometimes observed, and many have been deceived, for the eye retains its perfect transparency. Here, also, medical treatment is of no avail.

The serous membranes are of great importance. The brain and spinal marrow, with the origins of the nerves, are surrounded by them; so are the heart, the lungs, the intestinal canal, and the organs whose office it is to prepare the generative fluid.

Inflammation of the brain.—Mad staggers fall under this division. It is inflammation of the meninges, or envelops of the brain, produced by over-exertion, or by any of the causes of general fever, and it is characterized by the wildest delirium. Nothing but the most profuse blood letting, active purgation, and blistering the head, will afford the slightest hope of success. *Tetanus* or *locked jaw* is a constant spasm of all the voluntary muscles, and particularly those of the neck, the spine, and the head, arising from the injury of some nervous fibril—that injury spreading to the origin of the nerve—the brain becoming affected, and universal and unbroken spasmodic action being the result. Bleeding, physicing, blistering the course of the spine, and the administration of opium in enormous doses, will alone give any chance of cure. *Epilepsy* is not a frequent disease in the Horse, but it seldom admits of cure. It is also very apt to return at the most distant and uncertain intervals. *Palsy* is the suspension of nervous power. It is usually confined to the hinder limbs, and sometimes to one limb only. Bleeding, physicing, antimonial medicines, and blistering of the spine, are most likely to produce a cure, but they too often utterly fail of success. *Rabies*, or madness, is evidently a disease of the nervous system, and, once being developed, is altogether without remedy. The utter destruction of the bitten part with the lunar caustic, soon after the infliction of the wound, will, however, in a great majority of cases, prevent that development.

Pleurisy, or inflammation of the serous covering of the lungs and the lining of the cavity of the chest, is generally connected with inflammation of the substance of the lungs; but it occasionally exists independent of any state of those organs. The pulse is in this case hard and full, instead of being oppressed: the extremities are not so intensely cold as in pneumonia; the membrane of the nose is little reddened, and the sides are tender. It is of importance to distinguish accurately between the two, because in pleurisy more active purgation may be pursued, and the effect of counter irritants will be greater from their proximity to the seat of disease. Copious bleedings and sedatives here also should be had recourse to. It is in connection with pleurisy that a serous fluid is effused in the chest, the existence and extent of which may be ascertained by the practiced ear, and which in many cases may be safely evacuated.

The heart is surrounded by a serous membrane, the pericardium, that secretes a fluid, the interposition of which prevents any injurious friction or concussion in the constant action of this organ. If this fluid increases to a great degree, it constitutes *dropsy of the heart*, and the action of the heart may be impeded or destroyed. In an early stage it is difficult to detect, and in every stage difficult to cure.

The heart itself is often diseased; it sympathizes with the inflammatory affection of every organ, and, therefore, is itself occasionally inflamed. *Carditis*, or *inflammation of the heart*, is characterized by the strength of its pulsations, the tremor of which can be seen, and the sound can be heard at a distance of several yards. Speedy and copious blood letting will afford the only hope of cure in such a case.

The outer coat of the stomach and intestines is composed of a serous membrane, the peritoneum, which adds strength and firmness to their textures, attaches and supports and confines them in their respective places, and secretes a fluid that prevents all injurious friction between them. This coat is exceedingly subject to inflammation, which is somewhat gradual in its approach. The pulse is quickened, but small; the legs cold; the belly tender; there is constant pain, and every motion increases it; there is also rapid and great prostration of strength. These symptoms will sufficiently characterize *peritoneal inflammation*. Bleeding, aperient injections, and extensive counter irritation will afford the only hope of cure.

The time for *castration* varies according to the breed and destiny of the Horse. On the farmer's colt it may be effected when the animal is not more than four or five months old, and it is comparatively seldom that a fatal case then occurs. For other horses, much depends on their growth, and particularly on the development of their fore quarters. Little improvement

has been effected in the old mode of castrating, except the opening of the scrotum and the division of the cord by the knife, instead of the heated iron.

Synovial or *joint membranes* are interposed between the divisions of the bones, and frequently between the tendons, in order to secrete a certain fluid that shall facilitate motion and obviate friction. Occasionally the membrane is lacerated, and the synovia escapes. This is termed *opened joint*, and violent inflammation rapidly ensues. The duty of the practitioner is to close this opening as quickly as possible. Nothing is so effectual here as the application of the cautery. A great deal of inflammation and engorgement are produced around the opening, partially, if not altogether, closing it; or at least enabling the coagulated synovia to occupy and obliterate it. Perhaps, in order to secure the desired result, the whole of the joint should be blistered. After this a bandage should be firmly applied, and kept on as long as it is wanted. If there is any secondary eruption of the synovia, the cautery must again be had recourse to.

The Navicular Disease is a bruise, or inflammation, or perhaps destruction, of the cartilage of the navicular bone, where the flexor tendon of the foot passes over it in order to reach the coffin-bone. The veterinary surgeon can alone ascertain the existence and proper treatment of this disease. *Spavin* is an enlargement of the inner side of the hock. The splint-bones support the inferior layer of those of the hock, and as they sustain a very unequal degree of concussion and weight, the cartilaginous substance which unites them to the shank-bone takes on inflammation. It becomes bony instead of cartilaginous, and the disposition to this change being set up in the part, bony matter continues to be deposited, until a very considerable enlargement takes place, known by the name of *spavin*, and there is considerable lameness in the hock-joint. The bony tumor is blistered, and probably fired, but there is no diminution of the lameness until the parts have adapted themselves, after a considerable process of time, to the altered duty required of them, and then the lameness materially diminishes, and the horse becomes, to a very considerable extent, useful. *Curb* is an enlargement of the back of the hock, three or four inches below its point. It is a strain of the ligament which there binds the tendons down in their place. The patient should be subjected to almost absolute rest; a blister should be applied over the back of the tumor, and, occasionally, firing will be requisite to complete the cure. Near the fetlock, and where the tendons are exposed to injury from pressure or friction, little bags or sacks are placed, from which a lubricating mucous fluid constantly escapes. In the violent tasks which the Horse occasionally has to perform, these become bruised and inflamed, and enlarged and hardened, and are termed *windgalls*. They blemish the horse, but are no cause of lameness after the inflammation has subsided, unless they become very much enlarged. The cautery will then be the best cure. Immediately above the hock enlargements of a similar nature are sometimes found, and, as they project both inwardly and outwardly, they are termed *thorough-pins*. They are seldom a cause of lameness, but they indicate great and perhaps injurious exertion of the joint. On the inside of the hock a tumor of this kind, but of a more serious nature, is found. It is one of these enlarged mucous bags, but very deeply seated and the subcutaneous vein of the hock passing over it. The course of the blood through the vein is thus in some measure arrested, and a portion of the vessel becomes distended. This is a serious evil, since, from the deep-seatedness of the mucous bag, it is almost impossible to act effectually upon it. It is termed *bog* or *blood spavin*.

The cellular tissue which fills the interstices of the various organs, or enters into their texture, is the seat of many diseases. From the badness of the harness, or the brutality of the attendant, the poll of the horse becomes contused. Inflammation is set up, considerable swelling ensues. An ulcerative process soon commences, and chasms and sinuses of the most frightful extent begin to be formed. The withers also are occasionally bruised, and the same process takes place there, and sinuses penetrate deep beneath the shoulder, and the bones of the withers are frequently exposed. These abscesses are termed *poll evil* and *fistulous withers*, and in the treatment of them the Horse is often tortured to a dreadful extent. A better mode of management has, however, been introduced; setons are passed through the most dependent parts; no collection of sanious fluid is permitted to exist, and milder stimulants are applied to the surface of the ulcer.

An abscess of a peculiar character is found between the branches of the lower jaw in young horses. It is preceded by some degree of fever. It is usually slow in its progress, but at length it attains a considerable size, including the whole of the cellular tissue in that neighborhood. There is one uniform mass of tumefaction. This is *strangles*. It seems to be an effort of Nature to get rid of something that oppresses the constitution, and the treatment of it is now simple and effectual. It is encouraged by fomentations and blisters. It is punctured as soon as the fluctuation of a fluid within it can be fairly detected—the pus speedily escapes, and there is an end of the matter.

Farcy.—While the arterial capillaries are engaged in building up the frame, the absorbents are employed in removing that which is not only useless, but would be poisonous and destructive. They take up the matter of glanders and of every ulcerating surface, and they are occasionally irritated, inflamed and ulcerated from the acrimonious nature of the poison which they carry. The absorbents are furnished with numerous valves. The fluid is for a while arrested by them, and there the inflammation is greatest, and ulceration takes place. This is the history of the farcy cords and buds. Farcy is a highly contagious disease, whether or not it be connected with glanders. It, however, occasionally admits of cure from the application of the cautery to the buds, and the administration the corrosive sublimate or the sulphate of iron internally.

The skin of the Horse is subject to various diseases. Large pimples or lumps suddenly appear on it, and, after remaining a few days, the cuticle peels off, and a circular scaly spot is left. This is called *surfeit*. The cause is obscure, but principally referable to indigestion. A slight bleeding will always be serviceable. Physic rarely does good, but alteratives composed of nitre, black antimony, and sulphur, will be very beneficial. *Mange* is a disease of a different character. It is the curse of the stable into which it enters, for it will almost certainly affect every Horse. Thorough dressings with Barbadoes tar and linseed oil, in the proportion

of one of the former to three of the latter, will be the most effectual external application, while alteratives and physic should be given internally. *Hide-bound* is a very appropriate term for the peculiar sticking of the hide to the ribs when a horse is out of condition. The subcutaneous adipose matter is all absorbed. The alterative above recommended will be very useful here.

The legs, and the hind ones more than the fore ones, are subject to frequent and great and obstinate swellings, attended by great pain and considerable fever. It is acute inflammation of the cellular substance of the legs. Physic and diuretics, and tonics if there is the slightest appearance of debility, are the proper means of cure. Friction and bandages will also be useful occasionally. There is no disease in which the farrier and the groom do greater mischief than in this.

Grease is an undue secretion of the fluid which was designed to lubricate the skin of the heels, and that secretion is also altered in quality. The hind legs begin to swell—a fluid exudes from the heels—the hairs of the heels become erect like so many bristles, and the skin of the heel is hot and greasy. Soon afterward cracks appear across the heel; they discharge a thick and offensive matter, and then deepen. They spread up the leg, and so does the tumefaction of the part. In process of time the skin, inflamed and ulcerated, undergoes an alteration of structure; prominences or granulations appear on it, assuming the appearance of a collection of grapes, or the skin of a pine-apple. They increase, and a fetid discharge appears from the crevices between them.

The cause is generally neglect of the Horse. He is suffered to stand in the stable with his heels cold and wet, which necessarily disposes them to inflammation and disease.

In the first stage of grease, bran or turnip or carrot poultices will be serviceable, with moderate physic. Then astringents must be employed, and the best are alum or sulphate of copper in powder, mixed with several times the quantity of Bole Armenian, and sprinkled on the sores. These should be alternated every three or four days. The grapy heels are a disgrace to the stable in which they are found, and admit not of radical cure.

Splints are bony enlargements, generally on the inside of the leg, arising from undue pressure on the inner splint-bone, and this either caused by the natural conformation of the leg, or violent blows on it. These excrescences will often gradually disappear, or will yield to a simple operation, or to the application of the hydriodate of potash or blister ointments. *Sprains*, if neglected, occasionally become very serious evils. Rest, warm fomentations, poultices, or, in bad cases, blistering are the usual remedies. *Windgalls*, if they are of considerable size, or accompanied by much inflammation or lameness, will find in a blister the most effectual remedy. *Sprains of the fetlock* demand prompt and severe blistering. Nothing short of this will produce a permanent cure. *Sprains of the pastern and coffin-joints* demand still more prompt and decisive treatment. If neglected or inefficiently managed, the neighboring ligaments will be involved, more extensive inflammation will be set up, and bony matter, under the name of *ring-bone*, will spread over the pasterns and cartilages of the foot. Firing alone will, in the majority of cases, be efficient here.

Inflammation of the foot, or acute founder.—In speaking of the structure of the foot, the laminæ, or fleshy plates on the front and sides of the coffin-bone, were described. From over-exertion, or undue exposure to cold or wet, or sudden change from cold to heat, inflammation of these laminæ is apt to occur, and a dreadfully painful disease it is. It is easily detected by the heat of the feet, and the torture which is produced by the slightest touch of the hammer. The shoe must be removed, the sole well pared out, plentiful bleeding from the toe had recourse to, the foot well poulticed, and cooling medicines resorted to. The bleeding should be repeated if manifest benefit is not procured, and cloths dipped in dissolved nitre, which are colder than the common poultice, should be substituted. After this a poultice around the foot and pastern should succeed. Little food should be given, and that must consist of green meat or mashes.

Pumiced Feet.—This is one of the consequences of inflamed feet. The sole of the foot becomes flattened, or even convex, by the pressure of the weight above. There is no cure here, and the only palliation of the evil is obtained from the application of a shoe so beveled off from the crust that it shall not press upon or touch the sole. This, however, is only a temporary palliation, for the sole will continue to project, and the horse will be useless.

Contracted Feet.—By this is meant an increase in the length of the foot, and a gradual narrowing as the heels are approached; and as the necessary consequence of this, a diminution of the width of the foot and a concavity of the sole. In point of fact, the whale of the foot, including the coffin-bone, becomes narrowed, and consequently elongated. This change of form is accompanied by considerable pain; the action of the Horse is altered; there is a shortened tread, and a hesitating way of putting the foot to the ground.

The frog and heel would expand when the weight of the Horse descends and is thrown upon them, but the nailing of the shoe at the heels prevents it. Thence the pain and lameness. Mr. Turner of Regent-street obviates this by a very simple method. He puts four or five nails in the shoe on the outside, and only two on the inside. There is then sufficient room for the natural expansion to take place, and the foot and action of the Horse are little or not at all changed. This is an admirable contrivance, and recourse should always be had to it.

The Navicular Joint Disease.—There are many Horses with open and well-formed feet that are lame. In every motion of the foot there is a great deal of action between the navicular bone and the flexor tendon which passes over it in order to be inserted into the navicular bone. From concussion or violent motion, the membrane or the cartilage which covers the navicular bone is bruised or abraded, the horse becomes lame, and often continues so for life. This disease admits of remedy to a very considerable extent; no one, however, but a skillful veterinary surgeon is capable of successfully undertaking it.

Sand-crack is a division of the crust of the hoof from the upper part of it downward. It bespeaks brittleness of the foot, and often arises from a single false step. If the crack has not penetrated through the horn, it must nevertheless be pared fairly out, and generally a coating of pitch should be bound round the foot. If the

crack has reached the quick, that *must* be done which ought to be done in every case—a skillful surgeon should be consulted, otherwise false quarter may ensue.

False Quarter is a division of *the ligament* by which the crust is secreted. It is one of the varieties of sand-crack, and exceedingly difficult to cure.

Tread or *Overreach* is a clumsy habit of setting one foot upon or bruising the other. It should immediately and carefully be attended to, or a bad case of *quittor* may ensue.

Quittor is the formation of little pipes between the crust and the hoof, by means of which the purulent matter secreted from some wound beneath the crust makes its escape. The healing of this, and of every species of *prick* or *wound* in the sole or crust, is often exceedingly difficult.

Corns are said to exist when the posterior part of the foot between the external crust and the bars is unnaturally contracted and becomes inflamed. Corns are the consequence of continued and unnatural pressure. The thorough cure of corns will put the ingenuity of the operator to the trial.

Thrush is the consequence of unnatural pressure on the frog. It is the cause and the effect of contraction, whether it is found in the heels of the fore feet or the hinder ones. It is not difficult to cure when taken in time, but when neglected it often becomes a very serious matter.

Canker is the consequence of thrush, or, indeed, of almost every disease of the foot. It is attended by a greater or less separation of horn, which sometimes leaves the whole of the sole bare. This, also, like the diseases of the foot generally, is difficult of cure.

Few things are more neglected, and yet of greater importance to the comfort and durability of the Horse, than a proper system of *shoeing*. It is necessary that the foot should be defended from the wear and tear of the roads, but that very defence too often entails on the animal a degree of injury and suffering scarcely credible. The shoe is fixed to the foot, and often interferes with and limits the beautiful expansibility of that organ, and thus causes much unnecessary concussion and mischief.

The shoe of a healthy foot should offer a perfectly flat surface to the ground. The bearing weight of the Horse will then be diffused over the surface of the shoe, and there will be no injurious accumulation of it on different points. Too often, however, there is a convexity toward the inner edge, which causes an inequality of bearing, and breaks and destroys the crust. Round the outer edge of the shoe, and extended over two-thirds of it on the lower surface, a groove is sunk, through which pass the nails for the fastening of the shoe. At first they somewhat project, but they are soon worn down to the level of the shoe, which in the healthy foot should not vary from the heel to the toe.

The width of the shoe will depend on that of the foot. The general rule is that it should protect the sole from injury, and be as wide at the heel as the frog will permit.

The upper surface of the shoe should be differently formed. It should be flat along the upper end, outer supporting the crust, or, in other words, the weight of the horse, and widest at the heel, so as to meet and withstand the shock of the bars and the crust. The inner portion of the shoe should be beveled off, in order that, in the descent of the sole, that part of the foot may not be bruised. The owner of the Horse should occasionally be present when the shoes are removed, and he will be too often surprised to see how far the smith, almost wilfully, deviates from the right construction of this apparently simple apparatus. The beveled shoe is a little more troublesome to make and to apply than that which is often used by the village smith, but it will be the owner's fault if his directions are not implicitly obeyed.

Even at the commencement of the operation of shoeing, the eye of the master or the trustworthy groom will be requisite. The shoe is often torn from the foot in a most violent and cruel way. Scarcely half the clenches are raised when the smith seizes the shoe with his pincers and forcibly wrenches it off. The shrinking of the Horse will tell how much he suffers, and the fragments of the crust will also afford sufficient proofs of the mischief that has been done, especially when it is recollected that every nail-hole is enlarged by this brutal force, and the future safety of the shoe to a greater or less degree weakened, and pieces of the nail are sometimes left in the substance of the crust, which become the cause of future disease.

In the paring out of the foot, also, there is frequently great mischief done. The formidable *butteris* is still often found in the smithy of the country farrier, although it is banished from the practice of every respectable operator. A worse evil, however, remains. By the butteris much of the sole was injuriously removed, and the foot was occasionally weakened, but the *drawing-knife* frequently left a portion of sole sufficient to destroy the elasticity of the foot, and to lay the foundation for contraction, corns and permanent lameness. One object, then, of the looker-on is to ascertain the actual state of the foot. On the descent of the crust, when the foot is placed on the ground, depends the elasticity and healthy state of the foot, and that may be satisfactorily determined by the yielding of the sole, although to a very slight degree, when it is strongly pressed upon with the thumb. The sole being pared out, the crust on each side may be lowered, but never reduced to a level with the sole, otherwise this portion will be exposed to continual injury.

The heels often suffer considerably from the carelessness or ignorance of the smith. The weight of the Horse is not thrown equably on them, but considerably more on the inner than the outer quarter. The consequence of this is that the inner heel is worn down more than the outer, and the foundation is laid for tenderness and ulceration. The smith is too often inattentive to this, and pares away an equal quantity of horn from the inner and outer heel, leaving the former weaker and lower, and less able to support the weight thrown upon it.

Mention has already been made of the use of the *bars* in admitting and yet limiting to its proper extent the expansion of the foot. The smith in the majority of country forges, and in too many of those that disgrace the metropolis, seems to have waged interminable war with these portions of the foot, and avails himself of every opportunity to pare them down, or perfectly destroy them, forgetting, or never having learned, that the destruction of the bars necessarily leads to contraction by removing the chief impediment to it.

The horn between the crust and the bar should be well pared out. Every one accustomed to

Horses must have observed the great relief that is given to the Horse with corns when this angle is pared out, and yet from some fatality, the smith rarely leaves it where Nature placed it, but cuts away every portion of it.

The true function of the frog is easily understood. It gives security to the tread, and contributes expansion to the hoels; but the smith, although these cases come before him every day, seems to be quite unaware of the course which he should pursue, and either leaves the frog almost untouched, and then it becomes bruised and injured, or he pares it away so that it cannot come into contact with the ground, and consequently is not enabled to do its duty.

The owner of the Horse will therefore find it his interest occasionally to visit the forge, and guided by the simple principles which have been stated, he will seldom err in his opinion of what is going forward there. He should impress two principles deeply on his mind, that a great deal more depends on the paring out of the foot than in the construction of the shoe: that few shoes, except they press upon the sole, or are made shamefully bad, will lame the Horse, but that he may be very easily lamed by an ignorant or improper paring out of the foot.

Where the owner of the Horse has sufficient influence with the smith, he will find it advisable always to have a few sets of shoes ready made. Much time will be saved, in case of accident, and there will not be, as is too often the case, the cutting and paring and injuring of the foot, in order to make it fit the shoe. More injury than would be readily believed is done to the foot by contriving to get on it too small a shoe.

INSECTS MOST INJURIOUS TO VEGETABLES AND ANIMALS,

AND THE MEANS BEST CALCULATED TO COUNTERACT THEIR RAVAGES

BY REV. JAMES DUNCAN, M. W. S.

[From the Journal of the Highland Agricultural Society of Scotland.]

Lice.—Almost all our domestic animals are well known to be more or less infested with minute parasites, which have been long referred by naturalists to the genus Pediculus. The great majority of our native animals, whether wild or in a domestic state, have their peculiar kinds appropriated to them. Indeed, it was long imagined that each and every animal had its own peculiar parasite, but this is not altogether borne out by facts; for,

"Although, in the majority of cases, a distinct species of insect is found upon each particular animal, *i. e.* quadruped or bird, yet there are several instances where the same kind infests three or four different species of birds, but, in such exceptions, they are almost always confined to individuals of the same genera or family, or at least to species of similar habits. This is more strictly the case with birds than quadrupeds. For instance, *Decophorus icteroides* I have found on nearly every species of duck which has come under my notice. I have received it from other birds also; but they were of aquatic habits, and belonging to the order Natatores. The *Nirmus obscurus* infests several species of sandpipers, godwits, &c., the *Nirmus rufus* upon several of the hawks and falcons; and *Decophorus lari* upon nearly all the gulls. In the instances among quadrupeds it is rather doubtful whether the species is common to two different animals or not, or whether they may not have been merely transferred by associating or frequenting the same place of abode; as—for example, the *Trichodectes scalaris* found both upon the ox and ass—where the animals are feeding in the same stall, or sleep together, a transfer of property might easily be made. The *Hæmatopinus piliferus* infests dogs, and I have received specimens from the ferret, which last animal was said to swarm with them. Here it is rather difficult to account for the occurrence, as I am not aware that the two animals ever live on friendly terms with each other; and, moreover, the person from whom I received them informed me that he had not a dog. When we extend our observations to genera, we find they take a much wider range, and it is in only two or three cases that we could with any confidence assert that they were diagnostic of certain families of Vertebrata. It is easy to say whether they are belonging to quadruped or bird, but more difficult to pronounce the peculiar family of either, as some genera of each division appear perfect cosmopolites, as, for instance, the genus Pediculus of Linn., (since divided into Pediculus and Hæmatopinus,) besides infesting man, is also found in the orders *Quadrumana*, on monkeys; *Rodentia*, on the squirrel, hare, rabbit, water-rat; *Carnivora*, on the dog and seal; *Pachydermata*, on the swine, ass and camel; *Ruminantia*, on the deer, ox, and buffalo. The genus Nirmus, again, is very extensively spread, infesting every order of birds but the *Gallinaceæ*. Docophorus, all but *Gallinacea* and *Columbidæ*: Lipeurus infesting the orders *Gallinacea*, *Grallæ*, *Palmipedes*, and *Accipitres*; while, on the other hand, a few, as I have stated, are nearly certain indexes to the families. Eureum only on *Chelidones*; Trinoton only on *Palmipedes*; Goniocotes and Goniodes only on *Gallinacea* and *Columbidæ*; Gyropus only on the Guinea-pig in this country. Dr. Burmeister enumerates a species also from the Ai, (*Bradypus tridactylus*,) and, lastly, the genus Phthirius on man."*

Not only are there numerous instances of one kind of pedicular parasite being confined to one kind of animal, but in not a few cases there is a particular species assigned to different parts of the same animal, and these are seldom found to encroach on their respective provinces. This fact, in a physiological point of view, is exceedingly curious, and difficult to be accounted for. In Mr. Denny's beautiful work, a quotation from which has just been given, all the species hitherto found in this country are described and figured in a style of art which has been seldom surpassed as applied to entomological subjects. He enumerates nearly 250 different species as occurring on British animals. The great majority of these are found in too small numbers to produce any injury of importance; but others, again, as is well known to every one that rears and fattens cattle, multiply excessively at times, and are productive of great uneasiness and annoyance to the animals, while they greatly impair their look by denuding the skin of the hair, and giving it a very unsightly appearance.

Naturalists differ in opinion as to whether these insects undergo a true metamorphosis, like others of their class. The truth appears to be,

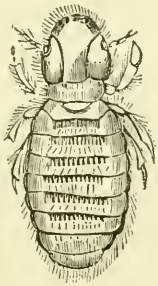
* "Denny's Monographia Anoplurorum Britanniæ," p. ix.

that the metamorphosis is very imperfect, and seems to consist in a series of consecutive changes of skin, and gradual increase in size, such as might be expected in an animal in its progress to maturity, rather than to form a metamorphosis, properly so called. In all stages they are active, and possess the power of taking food.

It is of importance, in a practical point of view, to be acquainted with the marks by which these troublesome and disagreeable parasites are distinguished, because different methods of destroying them require to be adopted according to their different habits and places of residence. The whole tribe is divided into two sections; the one containing such species as are provided with a tubular sucker, the other, the kinds having the mouth provided with two horny mandibles or jaws. These differences in the structure of the mouth must obviously exercise a great influence on their habits and general modes of procedure.

The first we shall notice, which is one of the most common and troublesome, belongs to the last-mentioned division; it is the *Trichodectes scalaris*. The genus Trichodectes is known by having the antennæ three-jointed; the tarsi with one claw; the head horizontal and scale-like, with the mouth beneath; mandibles strong, tridentate at the apex; the eyes very inconspicuous, and at all times invisible. All the species live upon quadrupeds, their food consisting of hair, wool, and exfoliated particles of the epidermis. Their jaws act horizontally, and cut off the hair close by the roots, exactly as if it had been done with a pair of scissors.

Fig. 1.



T. scalaris, Pediculus, bovis, Linn. LOUSE OF THE OX, is about half a line in length, the head and thorax of a bright rust-yellow, the former with two dusky spots in front, and of an abcordate shape; eyes prominent; antennæ pale yellow, the third joint longest and spindle-shaped; abdomen oblong, pale, tawny, finely pubescent, the first six segments with a transverse rust-red or dusky band on the upper half, and a large longitudinal spot of the same color on each side; the hinder extremity with a large similarly colored spot; legs pale; the claws nearly straight. (Fig. 1.)

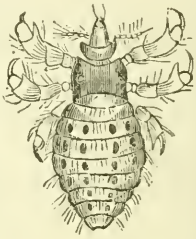
This species is very common on cattle, and for the most part is found about the roots of the hair on the mane.

Fig. 2.

T. equi, Pediculus equi, Linn. LOUSE OF THE HORSE.—Nearly one-half larger than the preceding, but in other respects bearing a close resemblance to it. The head and thorax are of a bright chestnut color; the head somewhat square, with the angles rounded, and much wider than the thorax, having an angular dusky line on each side posteriorly; antennæ pale, thick, the last joint longest, and somewhat club shaped; abdomen obconical, colored nearly as in *T. scalaris*; legs pale, thick and strong, the tibiæ abruptly elavate; the tarsi short. (Fig. 2.)

Common on the horse and ass, multiplying to a great extent when these animals are afflicted with certain kinds of diseases. It is said to be most plentiful when the animals are fresh from pasture. Several other species belonging to this genus are found on different animals. One occurs on the sheep, (*T. sphærocephalus.*) another (*T. longicornis*) on the fallow-deer, and a third (*T. similis*) on the red-deer; but they never appear to increase on these animals to an injurious extent.

Fig. 3.



Hæmatopinus cvrysternus. LOUSE OF THE OX.—In this genus the mouth is formed for sucking, there being a short tube projecting from the mouth; the antennæ are five-jointed; the thorax distinctly separated from the abdomen, and much narrower, shorter and broader than the head; abdomen large, depressed, commonly oval, consisting of eight or nine segments; legs formed for climbing, very thick and strong; claws single and incurved. Perhaps the most plentiful of all the species which infest cattle is that named above. The head, which is of a chestnut color, is somewhat triangular, rounded behind; the thorax dull chestnut, nearly square, with a spiracle and an impressed line on each side; abdomen greyish-white, or ochrey, smooth and shining, with four longitudinal rows of dusky, horny excrescences, the last segment with two black, curved marks; legs chestnut, the extremity of the claws black. Length from 1 to 1½ lines. (Fig. 3.)

It is this species, for the most part, that proves so troublesome to stalled oxen. It frequents chiefly the mane and shoulders. Being a suctorial insect, it cannot directly strip off the hair, but, by abstracting the juices by which the bulb or root of the hair is nourished, it makes it more liable to fall off, and the irritation its punctures occasion causes the animals to rub themselves till the skin is quite bare. Mr. Denny remarks that the young are much more agile than the mature insect, and differ in nothing except a want of proportion, the limbs being much thicker as compared with the bulk of the body than when adult. Another species, somewhat similar in appearance, (*H. vituli,*) occurs in the calf, but it does not appear to be common.

Fig. 4.

Hæmatopinus suis. Pediculus suis. Linn. LOUSE OF SWINE.—Head and thorax dusky rust-color, the former somewhat pear-shaped, with an angular black line at the apex, and one on each side before the eyes; hinder angles of the thorax acute, each side with a distinct spiracle; abdomen large, flat and oval; of a membranaceous consistency, bluish of yellowish ash color, sometimes nearly white; the second and five following segments with a black,

horny excrescence on each side surrounding the spiracles: the hinder segment with a black patch on each side; legs pale, long and thick. Length $1\frac{1}{4}$ to $1\frac{3}{4}$ lines. (Fig. 4.)

This species is found, for the most part, in great plenty on all kinds of swine, although certain breeds appear to be infested with more than others. Mr. Denny states that it does not appear to be so generally spread as might be expected from the dirty habits of the animals.

"It most frequently occurs (he says) on those fresh imported from the Sister Isle. It was many months before I could obtain a single example. I had applied to both farmers and pig butchers, neither of whom seemed to approve of the idea which I had conceived of *their* pigs being *lousy*, but referred me to those of the Emerald Isle as being sure to gratify my wishes—(forgetting, I suspect, that the Irish pigs come to this market to meet English buyers.) I accordingly visited a colony just arrived, when I certainly met with a ready supply; but here they were confined almost entirely to lean animals, and wherever I found a pig fat or healthy, no game were to be seen. In walking, this species uses the claw and tibial tooth with great facility (which act as finger and thumb) in taking hold of a single hair. The male is much smaller, with the abdomen shorter, suborbicular, and the segments lobate; the egg or nit is $\frac{3}{4}$ of a line in length, of a cream-color, and elegantly shagreened, oblong, and slightly acuminated, surrounded by a lid, which, when the young insect is ready to emerge, splits circularly, or, as a botanist would say, has a circumcisile dehiscence."

H. asini, Pediculus asini, Linn. LOUSE OF THE ASS.—About the size of the preceding species; color rust-yellow on the head and thorax, the former very long, narrow anteriorly, with two black patches on each side near the apex; abdomen large and ovate, pale-yellowish white, wrinkled and hairy, with a dusky, horny excrescence surrounding each spiracle; the last segment with a large angular black spot on each side; legs short and thick, the color of the thorax. Length 1 to $1\frac{3}{4}$ lines.

This parasite is very plentiful on the ass, particularly about the head and mane, but, probably, owing to the thick skin of the animal, it does not appear to occasion it much annoyance. The rabbit is also infested with a peculiar species of *Hæmatopinus*, and likewise the dog, but they seldom increase to any great extent.

These are the principal pedicular parasites which are most annoying to our most useful quadrupeds. Birds of almost every kind, whether wild or tame, have also their peculiar inhabitants of this class; not a few of them are infested by several different kinds. This is the case more especially with the common domestic fowl, which has at least five species appropriated to it. Of these, one of the most common, which may be seen running over the hands of those employed in plucking fowls, and which is difficult to brush off, owing to the flatness and smoothness of its body, is the

Menopon pallidum, Pediculus gallinæ, Linn. It is very minute, not exceeding $\frac{1}{2}$ or $\frac{3}{4}$ of a line in length; the color pale straw, the surface shining and smooth; head triangular and obtuse, with pitchy spots on each side; antennæ with the fourth joint large and oblong, and terminating in a tuft of hairs; eyes dark; abdomen elongate oval, the segments equal; legs rather thick, the anterior thighs broad and round. The other species which infest poultry are the *Goniodes dissimilis*, a genus remarkable for having, in the males, the third joint of the antennæ recurved toward the first, and forming a claw, by which the insect can lay hold of a hair, the barb of a feather, or any other small object; *Goniocotes hologaster*, having the head, thorax and legs pale yellow, with pitchy black marginal bands and spots, and the abdomen with pale ash-colored lateral bands bordered with black. Neither of these two species is common. But the *Lipeurus variabilis*, which may be known by being of a dull white color margined with black, is very abundant on the domestic fowl, preferring the primary and secondary feathers of the wings, among the webs of which it moves with great celerity.

Two or three different species inhabit the various kinds of pigeon. Of these the most common is *Goniocotes compar*, which has a large ahed, with produced acute angles behind, from each of which two long bristles project; abdomen white, broad and obovate, the margin all round rusty brown; length from 1 to $1\frac{1}{3}$ line. Next to this in frequency, and sometimes still more abundant, is *Lipeurus baculus*, the body of which is very narrow and elongated, the head angular and depressed; the abdomen nearly cylindrical, dull yellow-white, with a series of large trapezoidal dusky patches on each side. Few birds, Mr. Denny remarks, are so infested with parasites as the *Columbidæ*; besides four species of lice, he has found upon them a large *Ixodes*, a small *Acarus*, and the *Pulex columbæ*; and Rev. S. Jenyns detected a bug, *Cimex columbarius*, which he has described in the "Annals of Natural History."*

Grouse, and their near ally, the common partridge, are far from being exempted from these unwelcome visitors; and in unhealthy seasons, when the former are in a debilitated state, the attacks of the parasites tend greatly to retard or prevent their recovery. *Goniodes tetraonis* infests both the black-cock and common grouse, and is, for the most part, very common. The form of the head resembles that of *Goniocotes compar*; color of the head and thorax pale chestnut yellow; abdomen pale yellowish-white, obovate, lateral margin bright chestnut, each segment, except the antepenultimate, with a pitchy sutural, somewhat club-shaped, abbreviated band. Length about a line; the female somewhat larger. *Nirmus cameratus* is also common on the red grouse. It is much smaller than the above, deep chesnut color and pilose; head short, and somewhat heart-shaped; central band and sutures of the abdomen pale yellow white. The species most frequently observed on the common partridge is *Menopon perdricis*, a very minute insect, not exceeding $\frac{2}{3}$ of a line in length, of a dull ochrey yellow, the head large and almost semilunar, with a dusky spot on each side, and a band before each eye; the abdomen broad. A more remarkable looking species, also frequenting this bird, is named *Goniodes dispar*, but it is not of frequent occurrence. One of the largest known parasites of this class occurs on the peacock. It is *Goniodes falcicornis, Pediculus pavonis*, Linn. The female is about 2 lines in length; and the male has the first joint of the antennæ with a large tooth on the internal edge; second cylindrical; the apex oblique; third long and recurved; fourth and fifth very small, in the female filiform. This insect may be found after the death of the bird collected in numbers about the base of the beak and crown of the head. *Goniodes stylifer*, which has a considerable general resemblance to the above, is found on the turkey; it is easily recognized

* Vol. V. p. 242.

by having the hinder angles of the head produced into a sharp projection like a horn.

Many other of our domestic birds, such as geese, ducks, &c., have each a peculiar parasite of this class assigned to them, and there are scarcely any of our wild birds that are without similar assailants. But in such cases, the parasites appear to do little or no injury, and it is unnecessary, therefore, to refer to them more particularly.

In regard to the means best adapted for counteracting the ravages of these parasites, lice on cattle and horses may be destroyed by a plentiful and repeated application of oil, and also by repeated rubbing of mercurial ointment into the affected parts of the skin; but, on using this latter substance, care should be taken not to expose the animal to rain or cold.

INDIAN CORN—USE OF IT IN ENGLAND.

"One who knows" wrote us before the opening of the British Parliament:—"You will see the duty reduced or taken off grain of all kinds. As to Indian Corn, it will take 20 years to introduce it into England. It is within my memory that potatoes have been brought into general use, and oat-meal within twenty years. They would as soon have taken ratsbane forty years ago, as have used oat-meal or drank buttermilk; as they called it eating horse-corn bread and drinking *pigs' punch.*"

Every thing must have a beginning, and, comparatively speaking, 20 years is as little time for change in the habits of a whole nation, as one year for an individual.

The best way to accelerate the change would be to station some old colored women cooks from the South—some of those who are going off to Liberia—in the hotels of Ireland, that land of green fields and rich butter, and in the kitchens of the opulent and fashionable, and the lower order would soon learn to overcome the prejudice springing from the impression that Indian Corn meal is eaten only by "pigs and negroes," as was said when Mr. Escott moved to take off the duty.

If Planters were cemented together and habituated to act under the influence of that *esprit du corps* which influences other classes each for its particular benefit, they would be taking measures to establish some agency in England which would facilitate the introduction and use of corn meal. No well-provided breakfast or dinner table is without it, in some most palatable form, in our Southern States, where people know what good living is, and usually *eat the best* and sell only *what they can't eat.*

PRICES CURRENT.

[*Corrected, March* 18, *for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort	℔ 100 lb.	4 — @	4 06½
Pearls, 1st sort, '45		4 37½ @	— —
BEESWAX—American Yellow		— 29½ @	— 30
CANDLES—Mould, Tallow	℔ lb.	— 9 @	— 11
Sperm, Eastern and City		— 26 @	— 38
COTTON—From	℔ lb.	— 6⅞ @	— 10½
COTTON BAGGING—American		— 12 @	— 13
CORDAGE—American	℔ lb.	— 11 @	— 12
DOMESTIC GOODS—Shirtings	℔ y.	— 5½ @	— 11
Sheetings		— 7 @	— 15
FEATHERS—American, live		— 26 @	— 32½
FLAX—American		— 7½ @	— 7¾
FLOUR & MEAL—Genesee	℔ bbl.	5 50 @	5 56½
Troy		— — @	— —
Michigan		5 50 @	— —
Ohio, flat hoop		5 50 @	— —
Ohio, Heywood & Venice		6 25 @	6 37½
Ohio, via New-Orleans		5 12½ @	5 37½
Pennsylvania		— — @	— —
Brandywine		5 50 @	5 62½
Georgetown		5 12½ @	5 25
Baltimore City Mills		5 — @	5 12½
Richmond City Mills		6 50 @	— —
Richmond Country		5 25 @	5 37½
Alexandria, Petersburg, &c.		5 — @	— —
Rye Flour		3 87½ @	4 —
Corn Meal, Jersey and Brand		3 37½ @	3 50
Corn Meal, Brandywine	hhd.	16 — @	— —
GRAIN—Wheat, Western	℔ bush.	1 15 @	1 25
Wheat, Southern	new	1 10 @	1 15
Rye, Northern		— 80 @	— 85
Corn, Jersey and North (meas.)		— 68 @	— 70
Corn, Southern (measure)		— 68 @	— —
Corn, Southern (weight)		— 67 @	— 68
Oats, Northern		— 44 @	— 45
Oats, Southern		— — @	— —
HAY—North River	bales	— 80 @	— 85
HEMP—American, dew-rotted	ton	85 —@	100 —
" " water-rotted		125 —@	175 —
HOPS—1st sort, 1845		— 20 @	— 30
IRON—American Pig, No. 1		35 — @	37 —
" Common		25 — @	30 —
LIME—Thomaston	℔ bbl.	1 05 @	— —
LUMBER—Boards, N.R.	℔ M. ft. clr.	35 — @	40 —
Boards, Eastern Pine		11 — @	13 —
Boards, Albany Pine	℔ pce.	— 10 @	— 19
Plank, Georgia Pine	℔ M. ft.	32 50 @	35 —
Staves, White Oak, pipe	℔ M.	50 — @	— —
Staves, White Oak, hhd		40 — @	— —
Staves, White Oak, bbl		31 — @	— —
Staves, Red Oak, hhd		27 — @	30 —
Hoops		25 — @	30 —
Scantling, Pine, Eastern		— — @	16 25
Scantling, Oak		30 — @	35 —
Timber, Oak	℔ cubic foot	— 25 @	— 37
Timber, White Pine		— 18 @	— 25
Timber, Georgia Yellow Pine		— 20 @	— 25
Shingles, 18 in	℔ bunch	1 75 @	2 —
Shingles, Cedar, 3 feet, 1st quality		— — @	24 —
Shingles, Cedar, 3 feet, 2d quality		22 — @	23 —
Shingles, Cedar, 2 feet, 1st quality		19 — @	— —
Shingles, Cedar, 2 feet, 2d quality		16 — @	18 —
Shingles, Cypress, 2 feet		13 — @	14 —
Shingles, Company		— — @	29 —
MUSTARD—American		— 16 @	— 31
NAILS—Wrought, 6d to 20d	℔ lb.	— 10 @	— 12½
Cut 4d to 40d		— 4 @	— 4½
PLASTER PARIS	℔ ton	2 62½ @	— —
PROVISIONS—Beef, Mess	℔ bbl.	8 — @	8 25
Beef, Prime		5 25 @	5 50
Pork, Mess, Ohio		10 75 @	11 25
Pork, Prime, Ohio		9 — @	9 37½
Lard, Ohio	℔ lb.	— 6¾ @	— 7½
Hams, Pickled		— 6 @	— 6½
Shoulders, Pickled		— 4 @	— 4½
Sides, Pickled		— 6½ @	— —
Beef, Smoked	℔ lb.	— 6½ @	— —
Butter, Orange County		— 14 @	— 18
Butter, Western Dairy		— 12 @	— 14
Butter, ordinary		— 10 @	— 12½
Cheese, in casks and boxes		— 7 @	— 8
SEEDS—Clover	℔ lb.	— 8½ @	— 10½
Timothy	℔ tierce	13 — @	17 —
Flax, Rough		9 — @	— —
SOAP—N. York, Brown	℔ lb.	— 4 @	— 6
TALLOW—American, Rendered		— 7 @	— 7⅞
TOBACCO—Virginia	@ lb.	— 3 @	— 6
North Carolina		— 3 @	— 5
Kentucky and Missouri		— 3 @	— 7
WOOL—Am. Saxony, Fleece,	℔ lb.	— 38 @	— 40
American Full Blood Merino		— 36 @	— 38
American ½ and ¾ Merino		— 30 @	— 33
American Native and ¼ Merino		— 28 @	— 28
Superfine, Pulled		— 28 @	— 30

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DESULTORY HINTS TO FARMERS—LABOR-SAVING, &c.

BY HORACE GREELEY.

[In the protracted absence of the Editor on a most interesting and gratifying Southern tour, one of the Publishers is impelled to put forth some crude suggestions regarding Agriculture in this Number of the Journal. As they may pass through the press before the return of Mr. SKINNER, the reader will be so just as not to hold him responsible for any error they may contain.]

WHEN I was a lad ten years old, my father took a job of clearing fifty acres of low, wet land in Vermont, which had originally been a pine forest, with a considerable proportion of black ash, &c. (probably a later growth,) but had more recently been overrun with fire in an extremely dry season, and was thickly covered, among its mostly dead and decaying timber, with an undergrowth of blue beach, alder, &c. &c. This clearing was a miscellaneous undertaking. Commencing in March, the whole tract was covered with water knee-deep, held there by the masses of fallen and decaying pines, the roots of the still standing trees, &c. We were visited while at work there by a good many neighbors and wayfarers, who comforted my father with the assurance that he never could accomplish what he had undertaken—that his boys, of ten and nine years respectively, would be 'out of their time' before he could finish it. He persevered, however, with the help of these boys, and completed the job in about two years. When it was done, and we had a chance to look back upon it, I could not help seeing that about one-third of our work had been positively wasted, and might have been saved by adequate knowledge. Half the labor was devoted to cutting up the great pines so that they might be hauled together and burnt, to digging out the rotten wood from the earth in which it was nearly imbedded, &c. which might have been entirely avoided. Had we been wise enough to cut down every green tree and bush to begin with, take out whatever was worth preserving for timber or fuel, then clear a wide space between our tract and the adjoining wilderness, and, in the very dry season which rarely fails to come once in a Summer or Autumn, had simply mowed some of the swamp-grass, weeds, &c. which grew in all the open spaces, and put it in the fire, we should have been saved months of rugged toil.

This experience has led me since to regard with interest the works and ways of Farmers in subduing and cultivating their lands, and my impression is that *one-third* of the labor thus bestowed is absolutely thrown away. More thorough and general knowledge of the laws of Nature and the means of subjecting her powers and processes to the use of Man would save at least this much, and in time probably more. Let me indicate a few particulars in which such improvement has already been made as to give promise of much more:

Hoeing Corn and other planted crops was formerly the chief business of New-England Farmers through June and a good part of July. Each field must be gone over with the hoe from twice to four times, requiring a great outlay of time and effort. But experience has shown that the corn-plant, like others, knows about how deep to root itself in the earth without extraneous assistance, and that the Plow or Cultivator can perform nine-tenths of the work formerly entrusted to the Hoe at one-fourth the expense. Of course there are soils which re-

quire more or less labor with the hoe, but the general truth still stands, that an immense amount of labor formerly performed with the Hoe either is or may be saved. Doubtless, implements will yet be invented, improving on the plows and cultivators now in use, which will greatly diminish the amount of human labor still requisite in the culture of planted ground.

Sowing Grain on tolerably smooth ground is a process which the slightest consideration must commit to the proper domain of machinery. Sowing by hand is not only a slow process, but so imperfect and capricious that far more seed is required than would be if each grain were placed just where one should be and none elsewhere. Accordingly I observe a statement in the papers that a machine has been invented in England whereby half the seed is saved, with still more of the labor of sowing, while the work is far better done and the yield consequently greater. It is a shame to our farmers that they have waited for this invention to be made across the water. Our Western prairies are naturally the finest grain-fields in the world, and afford the fullest scope for the inventive genius of the husbandman. There the greatest improvements in Grain Culture should originate or at least be promptly adopted and improved upon, and this among them. It seems to me practicable to construct a machine which will combine the processes of Sowing and Harrowing in. so that each seed shall be placed at proper distance from every other, covered to the proper depth and no more, and all be accomplished with less labor than is now required merely for covering, so as to save altogether the labor of sowing and half the seed usually sown to the acre. And even this should not satisfy the cultivator of the spacious, fertile, mellow prairies. Why should not Corn be dropped and covered by a similar process? We might thus give to each kernel a due distance from every other in the hill, which is but occasionally effected now, could plant the five or six kernels in a hill in the precise form of a cross, a square, a circle, or any other that might be deemed best, and place every row and hill at exactly equal and the proper distances from every other. I am confident there is a chance for improvement here, whether my hint toward such improvement be worth anything or not.

The substitution of the Cradle for the Sickle, the Threshing-Machine for the Flail, the introduction of the Fanning-Mill, &c. into universal use, have effected similar savings. The labor required to produce a thousand bushels of the various grains is probably a third less than it was forty years ago. Yet improvement has been made slowly and with difficulty, in the face of obstinate prejudices and a more culpable indifference or incredulity on the part of most Farmers. Even now, with the trophies and substantial fruits of past triumphs all around them, the mass of farmers hardly believe that their calling is susceptible of farther advancement, though to the observing mind it must be evident that the work has just begun.

Breaking Flax and other fibrous plants was formerly one of the most toilsome and tedious pursuits of the farmer, and at last, owing to improvements in the culture of Cotton and the consequent cheapening of the product, Flax has almost ceased to be raised here for the fibre. I know that good farmers have sown and harvested many acres of it in years past for the seed only.—Yet there was exhibited at the last Fair of the American Institute a combination of machinery, patented by a Mr. Billings of Missouri, whereby Flax or Hemp may be thoroughly broken and cleaned at a cost of one cent per pound, and with an immense saving both in the quality and quantity of the fibre. The rotting is performed in two days in vats of *warm* water, heated from the fire under or about the steam engine which propels the machinery, and no man need be told that the fibre is stronger and brighter than where months of exposure to the caprices of the elements are devoted to the rotting process. The saving in quantity is estimated at twenty per cent.—the woody substance being detached from the fibre with a slight and uniform application of force instead of the hacking and mangling of the old "flax-break." I do not see why this machinery should not work an industrial transformation equal to that effected by its predecessor the Cotton-Gin, especially as the spinning of Flax by machinery is no longer deemed impossible. It is now done regularly in Connecticut as well as over the water, and doubtless will be brought gradually to a state of efficiency and perfection equal to that attained by the Cotton manufacture.

And this naturally leads to the reflection that every new achievement in Labor-Saving suggests farther and still farther triumphs. If one of these Flax-dressers were conveniently located in each township where Flax might be advantageously cultivated, I cannot doubt that its operation and primary use would speedily suggest many other uses of the same or similar machinery, to some of the neighboring farmers. The steam-power, the rotting-vats, the breaking and dressing machinery, would either be applied directly each to some other desirable end in farming economy, or it would suggest machinery based on similar principles and employed to produce different but equally desirable results. Thus a machine invented to dry Cane Sugar by a rotary blowing process, having proved deficient in power for that purpose, has yet been applied to other purposes with decided success. I have seen it employed to dry

rinsed clothes in a great Washing establishment, and was assured that it performed admirably. The mighty progress of Invention during the last half century has yet been a gradual, step-by-step advance. There probably never was a man with genius sufficient to have invented outright one of the power-looms now used in the manufacture of the richest Carpets, Shawls, &c. To construct a modern Steamship would have defied all the power and skill of Archimedes. From the first rude conceptions of Fitch or Fulton to a steamboat like the Oregon or St. Nicholas is a distance not to be traversed by any one intellect. It has been traversed, however, in a moderate lifetime, by the successive improvements of one man on the suggestions of a predecessor and so on. In Agriculture only is this advance halting and capricious. Half the meadows and grain-fields as level as a house-floor are still harvested by scythes, cradles and rakes, although the facility of attaining the same results by the best machinery with half the labor has been abundantly demonstrated.

The slowness with which improvements are adapted by the most of farmers spring from two causes, want of means and want of knowledge. The plow-jogger who barely and hardly lives by scratching the face of Nature will tell you, if pressed, that he knows that Deep Plowing is the correct course, but what is he to do with his one light, gaunt yoke of cattle, that had to browse half the winter for want of hay, or his skeleton span of horses, that are just able to hold each other up by the help of the harness? He would like to cover his land with lime, guano or some other fertilizer, but then he has n't money to buy it nor even time and team to draw the muck out of his own swamp-holes, where it has lain from time immemorial, loading the summer air with noxious vapors to poison the health of his family. He would like to farm better, but the sheriff and the tax-gatherer are on his track, and the mortgage on his farm (if it is not a leased one) warns him against devoting too much time to costly improvements of which the benefit cannot all be realized this year. So he worries on, skinning his starved acres by the help of his starving brutes, until the sheriff steps in and turns him off to seek in the Far West some region where the rewards of good farming can be enjoyed by bad, shiftless farmers. If any body knows where that region lies, let him proclaim its whereabout speedily, so that the men who belong there may go at once. As it is, there are thousands who began in New England, moved thence to Western New-York, afterward to Ohio, then to Michigan, next Illinois, are now in Iowa, and mean to start for Oregon as soon as they can compass an outfit—all along cursing their hard fate in being trained to so poor a business as Farming, and grumbling at the great profits of merchants, manufacturers, &c. when in truth farming is the only business by which they could have earned a livelihood at all. If almost any other business were followed as ignorantly, carelessly, *shiftlessly* as Farming quite commonly is, those engaged in it would break the first year. No mechanic or manufacturer could afford to neglect or misimprove his advantages as half the farmers habitually do theirs.

Want of Means is often a real but sometimes an imaginary or avoidable clog on the farmer's energies. He who has little or nothing to do with can only do the best he can; though even he may find means by taking just the right course. Whoever clings closely to the region wherein he is best known and rigidly maintains a character for integrity, industry and economy, need not long stand in need of any requisite means. But let him be careful not to involve himself for any thing more than he actually does need. Many a farmer staggers through life under an outlay of $3,000 for a farm when his labor well bestowed on half as much land would have ensured as ample a product and saved him $100 a year in interest (or rent) and taxes. And now if our indebted farmers, who are worrying along on a hundred to two hundred and fifty acres each of land, would just let half or two thirds of it go, pay off their debts, resolve to be henceforth 'forehanded' by keeping no more land beside a small wood-lot than they can fertilize thoroughly and work faithfully, no intelligent person can doubt that immense benefits would result to them and to all. The same area of soil would support twice the present agricultural population, giving extensive employment for years to brickmakers, lumbermen, house-builders, cabinet-makers and mechanics generally. The distance between each farmer and his merchant, blacksmith, shoemaker, &c. would be greatly reduced, and schools for his children would be brought gradually nearer and nearer his door. This process of relieving farms from mortgages and other incumbrances by dividing them, at the same time by superior culture trebling and quadrupling the aggregate product, ought to be encouraged and accelerated. The cultivator will never improve a mortgaged or leased farm so heartily as he will once that he owns and may transmit to his children beyond peradventure. Before we can have the harborer of any nuisance like the Canada thistle or the producer in a good season of ten bushels of corn or half a ton of hay to the acre indicted by our Grand Juries as he should be, we must have unencumbered farms, and the owners cultivating them. There are able, enlightened men capable of managing larger Estates efficiently, but these are comparatively few.

But want of adequate Knowledge is a far more general and crying evil among farmers

than want of Means. I have no ability to supply this want, and pretend to none. The suggestions I venture to make at all are offered with extreme self-distrust, and are subject to the correction of every practical farmer. Yet can it be presumption in one who knows that one hundred bushels of Corn or three tons of Hay may be and often have been obtained from an acre, yet sees that the average yield is not more than one-fourth so much, to say that there is grievous deficiency somewhere? And when I have seen farms once fertile and productive rendered sterile and worthless by shallow plowing, no maturing, and shabby cultivation, until fields which once bore good Wheat have been sowed over and again with Rye until 'ryed out,' the product falling to five or six bushels per acre, and naturally the best meadows in the world mowed and fall-fed, and spring-trampled, until hardly enough grass could be obtained from a swath to wipe the mower's scythe, it surely is not presumption, comparing these with the opposite results of good farming, to say that this is the result of wretched husbandry and should be amended.

If want of Knowledge has afforded it surely can no longer afford a tolerable excuse for poor farming. The Agricultural Clubs which have been formed mainly in our cities may readily be copied and improved upon in every rural School District throughout the Country. There is no observing farmer or farm-laborer, however illiterate, whose experience may not afford some fact or hint of value to his brethren generally — Let the farmers of any School District meet statedly once a week or month (in the winter once a week cannot be too often) to compare observations, give the result of experiments, exchange seeds and cuttings, and read choice extracts from the best new works, and there cannot fail to result a decided and obvious improvement in the farms, the products and the farmers of that District. The boys, allowed to come in as listeners, will imbibe the spirit of the meeting, and be imbued with a laudable pride in and liking for their fathers' noble vocation. Many of them will learn more that is of substantial use to them in four years through such meetings, than they would by spending that time in College, though this also is desirable for some. They would learn to observe the processes of Nature and Industry going on around them, the value of Science and Knowledge, and gradually acquire the habit of expressing their ideas correctly, fluently and forcibly. They would learn to value their homes and the privileges therewith connected, and not pine to hurry away to Texas or Lake Superior in quest of some excitement or peril to relieve the tedium of common life. A Farmers' Club in each School District, with all the farmers participating in its advantages, would be worth more than a gold mine in each County of the Union.

From such a Club many incidental advantages of a pecuniary kind would naturally flow. The farmers thus statedly assembling would gradually fall into the habit of uniting in various enterprises of mutual interest; they would combine to purchase new implements or machinery needed by all yet costing more than any one could afford to expend for such a purpose. Thus Mowing and Harvesting Machines, Stump Extractors, &c. with many others, would be brought gradually into use where they otherwise might not be. One or more intelligent members would be deputed to attend the meetings and Fairs of County and State Societies, to visit and examine expensive new implements, &c. and report to the next meeting. Very likely, in case they were largely interested in any one branch of Industry, they would depute one or two of their number to go to market for the whole, as I observe by an advertisement that the Dairymen of Herkimer County in this State maintain a regular Society, with President and other officers, for the purpose of selling to the best advantage their Butter and Cheese. The vein here struck leads, who shall say whither? Enough that it well repays the labor of working, and may at any time be abandoned.

The farmer's life is shunned or loathed by many because it seems one of mindless drudgery. It ought not to be so. If half our farmers would study and reflect more, they might do less hard labor and yet accomplish more in the course of a year. Ten hours' work a day in summer and eight in winter ought, with good management, to give any man a good living. He who works so hard that he cannot read or reflect after the labors of the day are over because of fatigue, does not plan wisely. Let no man shun work when work should be done, but to delve, delve forever is not the end of a man's life. The farmer's evenings should be devoted to mental acquisition and rational enjoyment. To sup and tumble into bed is a hog's fashion, and highly injurious to health. But let the farmer have about him the choicest works on his own and auxiliary vocations; let these form the subject of study and conversation at least two evenings in the week, while the newspaper, the newest volume and the Oldest Volume also, have each their allotted season. Two or three dollars contributed by each family in a neighborhood or school district would go a great way in the purchase of standard books at modern prices.—These are but hints, which each reader will modify as his judgment shall suggest. I plead only for the essential thing of making Home pleasant and its hours of relaxation hours of instruction also.—But it is high time I had brought these rambling suggestions to a close.

TEXAS: ITS SUGAR LANDS, SOIL, &c.

OBSERVATIONS ON THE ORATION OF JUDGE ROST, DELIVERED BEFORE THE AGRICULTURAL AND MECHANICS' ASSOCIATION OF LOUISIANA,

May, 1845, *and first published in the* FARMERS' LIBRARY AND MONTH. JOUR. OF AGRICULTURE.

To JOHN S. SKINNER, ESQ.
Editor of the Farmers' Library.

THIS interesting discourse republished in the N. O. Bulletin, of the 27th of October last, is well worth the perusal of Sugar planters and of persons disposed to go into the culture of Sugar-Cane in Texas. It contains much valuable information and generally to be relied on, being sustained for the most part by "facts, careful observations, and practical results." But the learned Judge has fallen into a grave error in stating that Sugar-Cane will not rattoon on Galveston Bay; and he quotes Mr. J. C. Marsh as authority for this statement. Now so far is this from being correct, there is at this time growing on the immediate margin of Galveston Bay, on Col. Morgan's plantation, Sugar-Cane which has rattooned the *fourth* year. The third year of its rattooning, a number of stalks were taken to Galveston and exhibited in Shaw's Hotel, where they were seen by hundreds of persons, which had matured for seven feet. And the two preceding years the Cane had matured to an equal hight. In 1830, '31, and '32, Judge Williams cultivated Cane successfully on the Trinity, 20 miles from Galveston Bay, and the rattoons of the third year were equal to the growth of the first year; and the Sugar made by Judge Williams was equal to any ever imported from Louisiana. On the Caney, 40 miles from Galveston Bay, Mr. Duncan, Mr. Sweeny, and others, are now cultivating the Cane on a large scale, and with great profit. It will be an easy matter to ascertain from these gentleman whether Cane will rattoon in this neighborhood or not. Mr. McMillan, near Houston, 20 miles from Galveston Bay (its neighborhood) has Cane which matured last year, and the present, which is the fifth of its rattooning, seven feet high. It is a well-ascertained fact that the Sugar-Cane grown on the prairies near Galveston Bay furnishes more saccharine matter than that grown on the bottom lands, though it does not attain to so great an elevation as the latter. Yet some that was grown on the plantation of Col. Morgan already alluded to, was pronounced by a gentleman from the West Indies, equal to any Cane he had ever seen growing there. Col. M.'s was the ribbon Cane and the third year of its rattooning. The Cane of Mr. Sweeny's plantation on the Bernard has rattooned, I am informed, the sixth year The Sugar made by Mr. Duncan, who likewise plants on the Bernard, was considered in Galveston equal to any ever imported from New-Orleans. I might cite facts indefinitely to prove the incorrections of Judge Rost's statement concerning the Sugar lands of Texas generally and of Galveston Bay in particular. Mr. J. C. Marsh, therefore, if indeed such a person ever "planted in the neighborhood of Galveston Bay," has led the learned Judge into an error of fact. No planter of this name has been known or heard of in this vicinity by any of the inhabitants living here for the last fifteen years. I have, however, heard that a gentleman of this name is planting in Attakapas, Louisiana. But it is quite immaterial who is the author of the erroneous statement; my object is only to set forth the facts.

The Orange flourishes in high perfection in Galveston Bay. I lately visited New Washington and found the orange trees in Col. M.'s grove loaded with large fruit of delicious flavor. This grove stands on an elevated bluff exposed to the north wind, without the smallest protection, yet it was uninjured during the recent severe weather, which was the coldest that has occurred in this section since the winter of 1837-38. It surely will not be contended by the learned Judge Rost that the *climate* is too vigorous to allow the cultivation of the Cane.

Galveston Bay is a broad, irregular sheet of water extending from the Gulf some 30 or 40 miles into the interior of the country. Into the head of the Bay, on its north-east and north-west corners, the Trinity and San Jacinto rivers respectively discharge their waters. On the margin of these rivers are rich alluvial bottoms varying in breadth and abounding in Cane and the various trees of the growth of these latitudes, and furnishing most ample supplies of wood for timber and fuel. I may mention as a fixed point that New Washington, situated at the mouth of the San Jacinto, is nearly in latitude 29° 30′. The country bordering Galveston Bay and for a distance more than 30 miles into the interior, is of diluvial formation. The soil is from one to three or four feet deep, and reposes on a subsoil of clay containing considerable quantities of

cretaceous matters and from 30 to 80 feet deep. I derive these last numbers from wells which have been sunk on the immediate margin of the Bay, as well as 20 miles interior, at Houston for example. In no case, as I am informed, has the solid rock or a bed of sand been reached. The cretaceous matters have been found in considerable quantities from very near the surface to the greatest depths to which the earth has been penetrated. These cretaceous matters consist of partially decomposed marine shells thickly disseminated through the earth, and the abundant mineral matters which their presence indicates, must be a source of great fertility to the soil. The cretaceous matters are not so abundant as with the argillaceous matter to constitute marl, nor does it exist in the form of lime, as in the Alabama and Mississippi prairies; where, besides other inconveniences, it is destructive to feet of plantation animals. But there are adequate quantities of this essential component of fertile soils, and as it shall be exhausted by cultivation, it can be restored by deep plowing. I have mentioned that the soil varies from one to a few feet in depth; in color, too, it varies from an intense black to a brown in proportion to the quantities of *humus* or vegetable mould which it contains. In the cedar brakes where the herbage is not consumed by the fires to which the prairies are subjected, the quantity of vegetable mould in the soil is very great, and the color of the earth of an intense black. This is true in a less degree of the other timbered lands. Some of the open prairies resemble in respect to the quality last mentioned the cedar brakes, being protected in a similar manner by growths, one of the most abundant of which is an annual plant six to seven feet in hight, of the order of acacias. The soils vary in tenacity, but the most tenaceous, on being turned up and exposed to the weather, crumble and work light.

It would be out of place here to enter into any consideration of the advantage respectively of cultivating a plantation of prairie, or bottom, or timbered land, when the plantation is to be opened, for the superor fertility of the latter lands is admitted by all. The Galveston Bay lands offer a choice to the judgment of the planter; their fertility is known to all who have cultivated them. Their productions are Sugar, Tobacco, Cotton, Corn, etc. The Orange, Peach, Fig and Plum flourish in perfection.

The borders of the Bay furnish abundant supplies of wood for fuel for Galveston City; and, including the wood on the Trinity, San Jacinto, Buffalo Bayou and numerous small streams, the quantities are inexhaustible.

Galveston Bay, Buffalo Bayou, San Jacinto, and Cedar Bayou offer the great facilities of a perfectly safe and convenient navigation every day of the year: and the Trinity is navigable for 500 miles a considerable portion of the year. All these waters abound with fish of fine varieties; the coves are alive with swan, geese, brant, and ducks during the winter months; oysters of excellent quality and abundant, a few miles down the Bay; and the prairies and timbered lands furnish excellent range for horses and horned cattle, and roots and mast for hogs.

In health, the margin of Galveston is unsurpassed by any country under the same latitude; and for beauty of picturesque scenery it vies with the most renowned spots of the earth.

To the planter, then, of Sugar, Tobacco, Cotton, or Corn, Galveston Bay offers large crops, convenience to market, with healthfulness and beauty of situation.

Galveston, Feb. 9, 1846

TOWN SEWERAGE.

THE question has been raised by an active member of the Agricultural Association of New-York as to the practicability and value of turning the Town Sewerage of this City to horticultural purposes—our position lately has not enabled us to know the result of their inquiry. All things cannot be done at once. The world itself was not made in a day, but all cities that promise population and extension, should look ahead to the conversion to some useful purpose of all the offal of every kind which large populations throw off every day—and which too often become sources of malaria and pestilence, instead of wholesome subsistence.

"Were Glasgow properly washed out, I should judge the washings capable of irrigating at least 15,000 acres—a square of five miles; and this, at £30 per acre, would be worth £450,000; or, at only £20 per acre, £300,000 yearly. Taking into account the population of Glasgow, these sums are considerably under what Liebig allows. We should have here a stream of dirty water running out from the City, to return again in a stream of milk—a transformation effected by the mysterious metamorphic power of combined vegetable and animal assimilation. No doubt a large outlay of capital would be necessary, in the first place, to bring in and distribute a sufficiency of water over the City, and to effect a complete drainage; and in the second place, to raise the collected washings, conduct them by aqueducts to the proper distance, and spread them out in a complete net-work of irrigation; but the exuberant fertility which would thence be extended over a large space of country would more than doubly compensate the amount of outlay, while the improvement which would be effected in the health and even in the morals and character of the population of Glasgow would be inappreciable. In the event of this improvement being carried out generally, our beautiful rivers and streams, which now as they pass our cities and populous villages, suffer pollution by the drainage, would continue to run in crystal purity to the sea, sweet as when they first welled out in the fountains and springs from the bosom of our pastoral hills."

[Mr. Matthew, in the Glasgow National.

FRIENDLY HINTS ON A VARIETY OF SUBJECTS.

To JOHN S. SKINNER,

Editor of the Farmers' Library:

I HAVE carefully read all the Numbers which I have received of your valuable periodical, with the greatest interest and pleasure; and I congratulate you, my dear sir, both on the style of your publication and on the matter you have infused into it. It is precisely the kind of work much wanted by the great body of the agriculturists of this Country, and is well adapted to the rapid advancement, at this itme, of agricultural knowledge. It is elementary, scientific, miscellaneous and practical.

I have been particularly impressed with PETZHOLDT'S LECTURES ON AGRICULTURAL CHEMISTRY. They are written in a plain and scientific style, and in the true spirit of inductive philosophy, although I think some of his deductions are not quite legitimate. He is entitled to the rare praise of having managed to invest his subject with a deep interest by avoiding, as far as practicable, the use of technical terms, and of having succeeded in making his definitions and explanations easily comprehensible to the most unscientific reader. They may be, it is possible, too elementary for many persons, but that very fact must recommend them to a majority of your subscribers. Petzholdt's fault, perhaps, is, that like all men of science, he claims too much for his own peculiar department. I question very much whether *productive farming* can ever be prosecuted according to strict chemical rules, for there must be a limit to their application, and that limit is the *vital principle*. The properties of organic bodies, animal and vegetable, their phenomena, and the laws which control their action, belong rather to the Science of Physiology, while Chemistry is more particularly applicable to inorganic matter. I do not, however, by these observations, mean to underrate the value of Chemical Science. Agriculture is greatly indebted to it for its rapid progress and improvement, and is destined, I hope, to derive farther benefit from its researches. Still I cannot but entertain the opinion that there are numerous phenomena connected with vegetation and the influence of manure, which entirely elude chemical investigations. Their operations are different from those of the laboratory, and cannot be completely subjected to its laws. Petzholdt himself calls Agriculture an *Art* as well as a *Science;* and I imagine that much of its most valuable *practice* with culture to be the result of pure inexperience: the best system of cultivation in the world is to be found in Belgium and China, and the lands in these Countries have been tilled with the same kind of implements and on the same plan and rotation of crops for ages.

Our experience in this part of the Country, does not confirm Petzholdt's Theory of *Fallow;* but, on the contrary, if I understand it, is in contradiction of it. We have, strictly speaking, no fallow, as our fields are never idle. Our rotation is almost uniformly as follows, viz.: Clover, Wheat, Tobacco, and Corn, Wheat, Oats, and Clover. This system, with plaster sown in the Clover, was introduced nearly 50 years ago, in the form which I have mentioned, by Mr. John Galloway, as a substitute for the *old fallow-field* course, by which the lands had been *impoverished.* There can be no doubt that the present comparative fertility of our fields is due to Mr. Galloway's system—that is, to the substitution of the fallow-crop for the fallow-field; for you are aware that, owing to a most criminal neglect of stock-raising, and of the ordinary care elsewhere bestowed on the collection of manures and the formation of composts, the amount of manure returned to the soil is quite insignificant, except that which is hoarded for Tobacco beds: yet I believe there has been, and still is, a progressive increase of fertility in our lands, and I fancy that the crops, in this neighborhood, of our great staples, Wheat and Tobacco, were larger in 1845 than in any other previous year within the memory of man. Petzholdt says "the soil after *pure fallow* is more productive than after *fallow-crops* have been cultivated:" and this, it must be confessed, is a fair deduction from his premises. Nevertheless, we have greatly improved our exhausted lands, by the substitution of fallow-crops for pure fallow. The plaster has, doubtless, exerted some influence in producing this amelioration, but, it is believed, not from its direct action on the soil, from the fact that no great benefit has been observed to follow its application to the land, or to other crops than Clover; and the opinion is here pretty generally entertained that its principal advantages result from its beneficial effects on Clover.—Certainly it does not produce the same effects on land where Clover is not cultivated as a fallow-crop.

I shall not pretend to point out the precise manner in which Clover acts as a fertilizer—but it is most likely by drawing the alkaline silicates from the subsoil nearer to the surface. I cannot however, agree with one of your respectable contemporaries who speaks of restor-

ing to the land in a measurable degree, by the use of Clover, the alkalies of which it has been deprived by injurious cropping, "as every crop of Clover turned under will, by the process of decomposition, to which it will be subjected by the action of time, *generate* more or less of those essential elements [the alkalies] in every good soil." Surely he cannot mean to say that plaster, clover and lime possess the power of *generating* the alkalies by the same occult and mysterious process—by some alchemical operation! And yet such is the obvious import of his language, for, in the same article, he speaks of "a *creation* [by those agents] of a new supply of potash for the plants to feed on." And again he says—"Ashes, as our correspondent knows, is produced by the burning of wood, and *lime* produces in the earth a *combustion*—slow, to be sure, but still such a combustion as, in its chemical effects, among other things produces *potash*, and hence it is that lime, clover, and plaster act so as to keep up the supply of potash in Tobacco culture." The last quotation may serve as a key to the whole article, the meaning of which I take to be this, "that by the combustion, decay or putrefaction of vegetable matter, the potash *previously existing* in the plants is eliminated. The obscurity of meaning to which I have alluded as an illustration of what I deem to be a great evil of the present age, is owing, I am sure, to the careless and unphilosophical language employed; a fault which cannot be too sedulously avoided by those who write for our instruction. I have also recently noticed another instance of the improper use of scientific terms, in which a writer speaks of carbonic acid as "*a poison*." Nothing can be more incorrect. It may be taken into the stomach, as every one knows who has ever drank a glass of soda-water, with perfect impunity. It is true that the animal confined for a considerable length of time in an atmosphere of carbonic acid gas, will be *deprived of life*—and it is equally true that immersion in water, or hanging by the neck, will produce the same effect; but we would not say that a man who was drowned or hung had been *poisoned*.

Sufficient importance is not attached to the use of lime, as it regards the culture of Tobacco, when its principal advantage is attributed, as we sometimes see, to its action on inert vegetable matter and to its power of eliminating potash by a slow combustion; for Tobacco is essentially a *lime plant*, requiring more of that earthy alkali as a constituent, than any other cultivated plant of which I have any knowledge. Lime has been applied to our lands in very limited quantities, but always with wonderful success. Oyster shells may be otained for 1½ to 2 cents per bushel, and the cost of burning (when your own force is not employed) including the cutting of the necessary wood, is about the same. I prefer shell to stone lime, as it contains nearly 1½ per cent of phosphate of lime, a rare and valuable salt. I spread 12,000 bushels of shell lime in 1844, and the increased value of the next crop, I believe, paid all the moneyed expense. This is the opinion of my neighbors, whose opportunities of judging were better than my own.

One word on the subject of *Guano*. I have tried it on Corn, Wheat, Tobacco, and Grass—in the garden, on grape and strawberry vines, in ornamental flowers, and on culinary vegetables. It has applied in solutions, in slight rains and after showers in the autumn and in the spring—pure and mixed with plaster—in quantities varying from 150 lbs. to 300 lbs. to the acre, but with scarcely any effect perceptible to the eye. Some improvement, it was thought, was observed in the Tobacco beds. The Guano was used either under my own notice or under the direction of the managers, your old acquaintances, Tucker and Purdy; and all the precautions usually recommended for its application, were carefully observed. Why it so signally failed with me, when it has been so eminently successful elsewhere, according to authentic reports, I will not pretend to say—I certainly gave it a fair trial. The article was procured in Baltimore, the greater portion of it through the kind instrumentality of Mr. George Law, and was undoubtedly, pure, unadulterated *Peruvian* Guano. I am told that the last season was unfavorable to the action of Guano, but surely if its good effects are so contingent it must be too expensive except to the wealthy gentleman, who looks to farming as a fashionable recreation (for there is a fashion in all these things) than as a laborious occupation from which he is to support his family.

The soil of the West River District has never been analyzed that I am aware of, but it is obviously rich in the silicate of Potash. The best manure we can use (after carefully collecting the products of the stables and barn-yards,) is undoubtedly *Poudrette*, properly prepared: that is, with gypsum, sulphate of lime or sulphuric acid, and not with carbonate of lime which is the common way. Petzholdt seems to forget that human fæces are always mixed with large quantities of urine, the carbonate of ammonia of which would be converted into a soluble sulphate by the employment of gypsum or the other substances above mentioned.

It has been my intention to prepare for you a design for Farm Buildings adapted to Mary, land and Virginia cultivation, as soon as I can find the leisure, and if it will answer your purpose you will be heartily welcome to it.

Very respectfully, your obt. servt.

GEO. W. HUGHES.

West River, Md. March, 1846.

STEAM-POWER FOR FARMERS.

THE EXTENDED APPLICATION OF THE STEAM-ENGINE, OR OTHER IMPELLING POWER OF THE THRESHING-MACHINE, TO FARM PURPOSES:

BEING EXTRACTS FROM AN ESSAY ON THIS SUBJECT,* BY ROBT. RITCHIE, F. R. S. S. A. &C.
Civil Engineer, Edinburgh.....Premium, Ten Sovereigns.

THE rapid advancement which Great Britain has made by the influence of her steam-power and machinery in manufactures, commerce, and navigation, has not been without a corresponding effect, though perhaps not to the same extent, in Agriculture. The proof of this is visible in the strenuous exertions made by agriculturists, of late years, to avail themselves of the use of machinery and improved implements of husbandry to economize labor. With the power of the steam-engine at command—although not now, perhaps, to the extent it may ultimately be made available—the British farmer has it in his power, at a moderate expense, on almost every farm, to lessen the labor of the barn, to extend its application to various useful purposes, and to place farm economics in a position of advancement which they have not hitherto attained. . .

By far the greater portion of the threshing-mills erected in the agricultural districts of Scotland are propelled by horse-power; but however convenient the use of the horse-walk and fixed threshing-machine was to the farmer, and justly considered, when introduced, as a great improvement in barn operations, and is yet esteemed so, still it has not been without its inconveniences; but when contrasted with the laborious employment of the flail, yet so generally in use throughout the world, its greater expedition and efficiency become apparent; and, when we consider that the use of the flail was better than the feet of animals, we may be enabled to form some idea of the value of the horse-mill to farm purposes. Still, of later years, the intelligent farmer has hailed, with much satisfaction, the application of a new impelling power to the threshing-machine—a power whose dominion extends over every branch of the arts and manufactures of our country—which has given an impulse to modern nations, a command over the produce of every climate, and of which the most learned nations of antiquity never could surmise.

The application of steam-power to farm purposes seems by far the most important improvement which has been made, connected with Agriculture, in these times, and must, from its obvious advantages, soon supersede every other power, except, perhaps, in a few isolated situations, where an ample water-power can be obtained, or where the smallness of the farms make it unimportant.

It is a good many years since steam-power was first applied to farms in Scotland, and, in the borders of England, in some few instances, from twenty to perhaps thirty years; but it is only within the last ten or fifteen years that it has become general, if it can even be said to be yet in general use.

The advantages of the steam-engine over wind, as the impelling power to the threshing-machine, appear to be, that it is always at command, and ready to perform the work required by day or night. Its advantages over water-power are, that neither heat can dry it up nor cold freeze it. Its advantages over horse-power are, that the motion is more regular and the work must be better done; for horses, in the threshing-mill, generally pull unequally, while the strain upon the limbs, in this severe work, proves injurious to them. When the farmer, too, has always his horses fresh and ready for the field, he can do more work with fewer horses;* and if a pair or more can be saved, it is an important item to him.

One manifest advantage of steam, as the first mover of machinery, arises from its rapidity and certainty. If the farmer, therefore, can bring his grain on the shortest notice into market—if he can either thresh one stack or a dozen without stoppage, and so avail himself of any sudden rise in the market, without delaying or retarding the other operations of the farm—he possesses advantages invaluable, though no other were attained—advantages which no other means of threshing can give him. But steam-power likewise possesses that steadiness of action which cannot be obtained while employing the horse, and a much greater quantity of corn can be threshed in a day. The usual quantity of corn threshed by a six-horse steam-power, is at the rate of five quarters per hour, but four quarters may be taken as the general quantity to thresh easily; however, the quantity must vary according to the grain and straw. If the average of horse-power, as generally driven, be taken at thirty quarters per diem, the average of steam-power may be taken at fifty quarters, giving an advantage of twenty quarters in favor of steam-power, while the latter is kept up at no other expense, save fuel of the cheapest description—culm or dross is generally used—and, unlike the horse, when not working, *costs nothing!* hence, in every point of view, the use of steam-power on farms must prove advantageous.

The author of the excellent Treatise on Agriculture in the last edition of the *Encyclopædia Britannica*, seems to have fallen into an error when he says, "Wind and steam-power require too much expense for most farms, and that the use of steam must be confined for the most part to coal districts." From the recent

* The author, by permission of the Directors of the Society, intends shortly to publish this Essay entire, with drawings fully explanatory of the different kinds of engines used on farms, mode of attachment to old mills, and connected with subordinate machines; with a historical sketch.

* The saving of a pair of horses to the farmer has been estimated at fully £100 per annum. Some farmers tell me, who have steam-power, that they can save a pair of horses out of four, on large farms.

date this article has been published, this opinion might not have been expected, if referring to the agricultural districts of Scotland. It may be presumed, therefore, the opinion has been inadvertently given, and if the author had entered more fully into the consideration of steam as a motive power, he would certainly not have classed it with wind-power. Indeed the rapid extension of steam-power to farms speaks volumes in its behalf. He would have found on investigation the immense benefit of the application of the steam-engine at a *very moderate expense to the farm.* A power which only requires to be understood to be more appreciated, and what almost every farmer who has used it has found to be one of the most advantageous improvements he has made on his farm-stead; and, while it increased his comfort, it was attended with no difficulty in the management, requiring no other attention than what any farm servant could easily give.

This power indeed, as applied to Agriculture, is yet in infancy; but with a prospect of gigantic manhood before it. it seems fitted in all probability, as it becomes more extended in its range of application, to change the entire face of the country, and give the same impetus to Agriculture, which it has done to all branches of the Arts. No well-informed farmer should be insensible to the value and utility of the steam-engine, even limited as it now is as a moving power to the threshing-machine, and the adoption of this power by him, in most instances, in the best agricultural districts of Scotland and borders of England, evince beyond a doubt, that it, in his opinion, is the best and most advantageous power which has been yet applied, wherever there are not insuperable obstacles intervening; and it shows how readily the enterprising farmer avails himself of whatever improvement enables him to support competition and improve the capabilities of his farm.

In England, *fixed* threshing-machines have not been much used for farm-steads, hence stationary steam-power mills are rarely to be met with. This may arise from a variety of causes without the value of these being overlooked by the various public-spirited agricultural associations scattered over the south. It cannot, however, be supposed, as its advantages become better known and understood, that the application of steam-power to farms, both in England and Ireland, will not in time become as common as in Scotland, where it has extended with amazing rapidity.* The threshing of grain with machines in England is generally carried on with portable mills wrought by horses; the threshing of grain being in some counties a regular branch of trade, the thresher removing his machine from farm to farm. Recently, steam-power has been strongly recommended at agricultural meetings (at the late show at Derby and other parts) for this purpose, and is now getting into use. The Dise Engine Company of Birmingham have invented a very compact portable engine, boiler, and threshing-machine, on a carriage. The whole machine provides for its being readily moved to different farms. Mr. A. Deans of Birmingham has also made, for a similar purpose, several forms of portable cylinder and piston engines, some with upright and some with horizontal cylinders. These engines are of different powers, from four to six horses', and the engine is placed on a neat iron carriage.—The whole occupying very little room, requiring no chimney-stalk or brickwork, and is drawn from place to place by one or two horses. It may be worked, he states, in the field or anywhere, without any fixing, for threshing corn, cutting chaff, and other agricultural purposes.—Mr. Deans' inventions are clever, and many of them will be found useful. His portable steam-engine, with patent irrigator and fire-engine combined, adapted at the same time for driving threshing-machines, pumping and draining, is deserving of the attention of the farmer. These applications are all very suitable for small farms, and dispense with the laborious employment of the flail. But the advantages of a fixed threshing-machine, and steady and cheap motive power, under the command of the farmer at all times, are so palpably apparent, that the only wonder can be how the farmer of land, to any reasonable extent, can do without it, as the want of it must place him under many disadvantages.

In the following remarks, respecting the subordinate purposes to which the prime or impelling power can be advantageously extended at the farm, the observations shall be confined to steam-power, although it will be easily understood that many additional uses to which this power can be applied may equally well suit any impelling agent of machinery in which there is a surplus power.

Before entering on this subject, it may be proper shortly to describe the form generally adopted, and give an example.†

In most of the new onsteads, where steam-power is used, the engine-house is generally an outshot from the barn. The boiler of the steam-engine is supplied from a well sunk at one side of the engine-room. This is the general plan with stationary farm-engines, and the back or surplus water from the boiler is returned to the well, the water being usually moderately heated before entering the boiler. But when well water cannot be obtained, which often happens in coal districts, a pipe is led to a cistern, from the nearest pond, from which the engine pumps the water directly into the boiler; or the engine may be made to pump the water from the pond at a moderate distance; but this is just taking so much power from the engine itself. It is desirable always that the pump throws up an ample supply of water, when high-pressure engines are used, to prevent, from negligence, the risk of overheating and burning the sides of the boiler; of course, with condensing engines, a much more abundant supply of water is indispensably necessary: hence the non-condensing engine has been in many cases adopted, from the smaller quantity of water it requires. The engine, about seven horse-power, is on the non-condensing principle, with over-head crank; and the attachment of the power to the mill is extremely simple. The threshing-mill itself possesses every modern improvement. There are elevators to lift the grain to the hand-fanners, and elevators to repass the refuse through the mill; both of which are likewise worked by the engine-power; likewise a corn and bean bruiser, which admits of being attached or detached at pleasure. The steam-engine has been several years in use,

* The Report on the Advantages of Steam as a Motive Power on Roads, by the House of Commons, is strangely coincident in the same reasoning.

† In the following remarks it is barely possible to be intelligible without sketches of the drawings which accompanied this Essay, except by those who are conversant with Scotch farm-steads; but as the paper and drawings will be subsequently published, reference can be made to the book.

and is most perfect of its kind, (it was made under my own direction,) and is capable of driving easily the threshing-machine and machinery connected with it, and also any additional machines which the farmer may find for his advantage to attach to it.

Another example is given, showing the connection of the steam-engine with a very complete set of farm-offices. This is entirely new, and would easily admit of subordinate machinery, if desired. This steam-engine is also of high-pressure or non-condensing, excellent of its class, and capable as it ought to be, of doing more than the work required of it. The neatest arrangement, however, of the steam-engine house and boiler, is when these buildings form a part of the range itself of the farm-buildings, and not an outshot from it.

But, in truth, there is no end to the different plans which could be adopted by a skillful farm-architect or farm-engineer; and it may be said every farm-stead requires a separate design to suit the locality and wants of the farmer. There are no parts of Scotland where so many snug, compact farm-buildings can be seen as in the neighborhood of Edinburgh, the accommodation is ample, without being superfluous. So rapid, indeed, has been the extension of steam-power to farms in this vicinity, that from the fine elevations round Edinburgh, more than 100 steam-engine stalks or chimneys may be observed as the landmarks of the farm, and giving a peculiar feature to the landscape.

Although the subordinate purposes to which the impelling powers of the threshing-machine have as yet been extremely limited, yet it admits of no doubt, if under proper control, it may be applied to a variety of useful purposes to which it has not as yet been applied, beside that of threshing grain. It is, therefore, of importance to consider the most simple and economical way in which the subordinate machines can be connected with the impelling power.

To the bruising of grain the power is commonly applied, and that most advantageously to the farmer. It has also been applied to chopping of hay, slicing of turnips, grinding of rape-cake, working a butter-churn, and driving circular saws; to these, and perhaps many other purposes, the first power has already been at different farms applied. An inconvenience however, arises—although, perhaps, of no very great importance—when the smaller machines are used, that they cannot be driven except when the threshing-mill shaft is set in motion, as the axle or shaft of the steam-engine connects the first power with the mill, and, if worked with belts, from a separate shaft; this latter shaft cannot be set in motion until the main engine-shaft, which connects engine and threshing machine, is going. When subordinate machines are used, worked by steam-power, they should be so contrived that the mill* may either be worked at the same time, or taken out of gear, and the machines worked or driven independently of the mill. This may be attended, perhaps, with more expense in the first erection, but it is more complete, and will, on most occasions when used, save a loss of much steam.

Several examples might be adduced in explication of these points. At one of the first steam-powers, for a large farm, put up in West Lothian, the steam-engine can either drive the threshing-mill in conjunction with grinding-mills for meal and flour, or the latter can be used by themselves. The machinery can be detached or taken out of gear at pleasure, and the whole is of the most perfect description. In such a case as this, the steam-power must be ample, which it is in the instance alluded to.

In another example of a simple description, in Mid-Lothian, an engine of eight-horse power, non-condensing, is regularly in use for a saw-mill, while, at the same time, it is the motive-power of the threshing-machine. The force is communicated to the saw-mill by means of a large cogged wheel placed on the main shaft, between the fly-wheel and engine itself, driving two circular saws. The power is taken from, or given to, either threshing-machine or saw-mill at pleasure, by means of pinions or small wheels. Cut wood is manufactured here to a considerable extent, which shows how easily the steam-power can be advantageously employed, and to do also the work of the threshing-machine.

It would be tedious to go over the various skillful applications which have already been made use of by enterprising farmers in the agricultural counties round Edinburgh. The subject is *new*, and, perhaps, but in infancy. Of course a great deal remains to be done by skill and ingenuity before such plans are extensively adopted; but I have little doubt as the value of steam, as before stated, becomes fully known, as the *best* PROPELLING POWER FOR THE FARMER, endless may be the applications of it even to farm purposes.

One of the best examples I have yet met with of the acknowledged utility of subordinate machines worked or driven by the first power, is at a fine farm in East Lothian. The steam-engine which drives the threshing-machine is a neat condensing-engine, but only of six-horse power. In addition to working elevators and dressing fanners connected with a complete threshing-machine, a shaft or axle—taking the power directly from the main-shaft of the mill—is led through the barn, which, by means of drums and belts, is made to work a corn-bruiser, barley-hummeler, and fanners, and likewise a pair of stones for a flour-mill, and a mill for grinding rape-cake; and, by an additional shaft, a circular saw. The whole of the machines are so arranged that they can be driven alternately, and the flour stones are let off to a neighboring miller, thus proving the economy of the arrangement. In addition to these machines, the spare steam from the boiler is made to heat a *drying-loft*, which is placed over the boiler-shed, on the floor of which small tin or iron pipes are laid, heated by steam from the boiler. These pipes are protected by a grating of wood, and the whole covered with hair-cloth. Damp grain is here dried with the greatest facility; and in wet seasons the drying-closet or room is found to be of great utility.

Indeed, the whole arrangement at the farm displays much skill and ingenuity; and we could not have a better example of a *small power* with which so many subordinate machines can be usefully employed without great trouble or expense.

I might give several more illustrations from *other farms* where great ingenuity has been displayed in economizing labor by machinery; but I think it unnecessary, as the one I have given is among the best instances I have met with where the advantages of such means were

* The word mill is used indiscriminately for threshing-machine.

duly appreciated and early adopted. However, it may be said that, in general, the impelling power is *strictly confined* to driving the threshing-machine and connections of it. Indeed, unless the steam-engine has ample power, it would be useless attempting to work more than the mill at one time; but we see, if the power is judiciously arranged, that even a steam-engine of *only* six-horse power can be made of powerful avail to the farmer.

It seems singular that the farmer of the present day does not turn more attention to these useful applications of ingenuity so advantageous to himself, of which I have given so striking an example; for, when we turn to the century that is past, which we are so apt to deride for its want of mechanical contrivances, and think so much behind the present age, we shall find much to admire if we have the patience to investigate. If we turn to the works of Dr. Stephen Hales, F. R. S., and other writers, farmers will find much curious and useful information. His plan of keeping corn sweet in sacks was considered of great benefit to farmers. A hollow reed or cane, perforated with 200 holes, was placed in the sack, and the nose of a common kitchen bellows placed into a wooden faucet attached to a leathern pipe ten inches long, distended by a spiral wire fixed to the top of the stick. Each stroke of the bellows would discharge a quart of air, sixty-four strokes per minute would convey a quantity of air equal to the capacity of a four-bushel sack. With the steam-power at command at the farm to drive a blowing-fan, such a scheme as this could be easily adopted by the farmer, and still exceed the plan of preserving corn by ventilation, which was much thought of at the time, although ventilators of a much simpler construction can now be readily applied for the purpose. It is stated (in the *Gentlemen's Magazine*, 1749) that the ventilators contrived by Dr. Hales for preserving corn were so much esteemed in France that M. de Humel de Monceau, a Member of the Royal Academy of Sciences, preserved a large heap of corn free from weevils for two years, without turning it, merely by *blowing air up through it.* He likewise procured a large granary to preserve, in the same manner, with ventilators worked by a wind-mill, quantities of corn, with a view of making it a general practice in France. Dr. Hales also applied his ventilators very usefully for sweetening milk when ill-tasted, also for water, by blowing showers of air through it. His ventilators in dairies would be found advantageous. If such was the knowledge of these matters in the last century, it seems singular how little has been really done to follow out the experience they acquired; yet it is not the less curious to observe the coincidence that so often happens between past and present inventions; for the plan I have described, as applied for drying grain in East Lothian, is a counterpart of the very plan recommended by Dr. Hales for drying malt, hops, &c. only the latter had the advantage in recommending blowing fresh air upward through wooden bars, "*or large laths, nailed to the floor, and hair-cloth to be laid on them.*"

While, therefore, improving the present inventions, do not let us overlook the past, and claim, as new ideas and inventions, what may have been known and applied centuries before. Let the information and appliances of the past be acknowledged as so much experience gained, and incorporated with the superior advantages in mechanical construction of the present times.

In applying the steam-engine power to subordinate purposes, and mixed machinery at new farm offices, there is more scope for the exercise of skill and judicious arrangement on the part of the farm-architect and engineer than when steam is made use of at old farm buildings. The method of connecting the first power to the machines, likewise admits of difference of opinion. It is sometimes done by belts and sometimes by cogged and beveled wheels. Although there is more friction by wheels, they are generally preferred by engineers, as belts are apt to slip, and cannot be durable, instances being found where in places in barns, or places infested with rats, they are even destroyed by these vermin. All main shafts or axles are invariably preferred to be connected with wheels, and likewise in connecting subsidiary or minor shafts to the first mover, wheels are made use of, although, in many instances, belts must be had recourse to, and, by having several shafts to lock and unlock to the main crank shaft, or to go easily in or out of gear, a variety of useful machines may be driven by steam-power at every farm at which steam is made use of.

At new farm buildings, in addition to driving the threshing-machine, the whole array of the minor implements or machines of the barn, and machines for preparing food for cattle and horses, machines for working the dairy utensils, machines for preparing artificial manures, machines for pumping or irrigation, by means of hose, machines for preparing grain for food, and machines for giving warmth and ventilation, might all be attainable, and easily made applicable at every farm, by means of steam-power.

Although such machinery may at first view appear *complicated*, yet in *reality* it *is not so*, and might be made of very easy management. I need not enter into any minute description of the methods of applying such subordinate machines as may be thus adopted. The details must be left to individual skill to execute. It is sufficient here that I suggest and point out the practicability of easily following out the suggestions made. With this view, the germ of such an arrangement of subordinate machines, applicable to the various purposes above noticed, I shall briefly describe.

A steam-engine of ample power (suppose six, or eight, or ten-horse power, for farms varying from 250 acres and upward) is erected, in the first instance, to drive the threshing-machine, and is supposed to be in daily use, as the *extended* application of steam-power *implies that the* farmer will find it to his advantage to make use of the engine almost constantly, or, at all events, in winter, to have the fire on the boiler. To be of real utility, the power must be generally available or at command, at least more frequently in use than *presently* done, where the engine and boiler remain a dead letter except when threshing is going forward; and where the refuse of coal or culm can be readily obtained, as in coal districts, there can be little apology wanted for not having the boiler regularly in use, which should be constructed on the most economical principles as regards fuel. The construction of the boiler is of most paramount importance in farm-engines, both as regards economy and safety. We have seen what has been done in locomotive engines, by industry and economy in fuel, shown fully in Mr. Macneil's evidence before the House of Commons in 1832. The evidence of Mr. Macneil in con-

vincing the Committee that experience will soon teach a better construction of the engines, and a less costly make, and generally a requisite supply of steam. When the steam-engine was not required for the purposes of the barn, it might, perhaps, in many farms, be advantageously employed for the purposes of pumping and irrigation. Supposing the engine, therefore, to be nearly in daily use, and having every modern improvement, and the threshing-machine of similarly improved construction, with elevators, hummeler, corn and bean bruiser, &c. &c. By a direct shaft from the steam-engine, with the power of attaching or detaching, taking in or out of gear at pleasure, meal or flour mill stones are applied, these, if inconvenient, to be worked by the farmer, or, if the corn-mill divides his attention too much, I have given an example where the spare power of the engine was let off to a neighboring miller. In several instances, however, I have met with farmers who advantageously made use of flour, barley, or meal mills at their farms, and if not used for grinding, a pair of stones would be found of great advantage for bruising grain, and several have been applied for this purpose in the south of Scotland and in Northumberland, at large farms, as much more powerful than the common corn-bruising rollers. From the same shaft a rape-mill, an oil-cake crusher, or even a malt roller, could be easily applied, and a circular saw be driven, and, if thought requisite, a bone-mill could likewise be wrought by the same shaft, and in many farms found useful for "converting ashes, and a variety of otherwise useless rubbish, into fertilizers." Another shaft passing through the straw barn could easily work a straw and hay cutting machine, and also a turnip and potato slicer. The former could be conveniently placed in the stable court (at no great expense a hayloft might be made above the straw barn) and the latter could be placed very conveniently near the cattle court, at the turnip court, or, if preferred, the straw-cutter could be advantageously placed there, instead of the turnip slicer, as these are found so useful in the field.

Other minor machines could easily be driven from these two shafts as they pass through the respective barns—such as a butter churn for dairy purposes. I have not dwelt much on machinery for dairy purposes, because dairy farms, on a large scale, are rarely combined with grain farms. However, as every farmer is more or less connected with feeding cattle and making butter and cheese, it must be obvious that the command of steam-power gives many advantages, and points out how the female department of the household can be saved much useless labor, and their attention turned to more profitable purposes. Thus the labor of churning by the churning-machine worked by steam-power will enable a great deal more work to be done in much less time.

In addition to the machines I have noticed at the general farm, I may mention that a very simple contrivance might construct a *tram*-way and wagon to the threshing loft, by which the engine could be made to *draw up* the grain to supply the threshing-mill, and *return down* the empty wagon, saving much manual labor. Elevators for grain could also easily be constructed to *lift up the grain* to the granary, and lower it upon the carts, wrought by the steam-engine.

The above are a few out of many practicable purposes to which mechanical science may be made to economize human labor, and render the exertions of the *farmer* more advantageous to himself. But a new element is mixed up with the applications of the steam-engine to farms, which, in another point of view, gives it still greater advantages, and these of a practical kind. I allude to the use *which can be made* of the *steam itself*.

A steaming apparatus is a necessary appendage to every farm of a moderate size, and its utility is very generally appreciated. The steam is commonly raised by a separate boiler, but very little skill would be required in applying the steam from the engine boiler to a complete steaming apparatus for cattle. The objections of the steam not being in constant use I have already alluded to. Where, indeed, the farmer is *resolved* merely to confine his steam-engine to threshing of grain, of course a portable steam-power would not apply—it would be inexpedient, perhaps, to draw steam from his engine boiler, or even put water for boiling turnips in wintering cattle. But the time will soon be past when the farmer will cease to be told, "What a pity it is you cannot make use of your steam-power, except merely for threshing, after going to so much expense for its erection—it is thus useless to you (keeping it idle) two-thirds of the year." As I have said, a test for the ingenuity of the farmer is to be shown, and he will be judged of as the cleverest and most practical farmer whose skill has brought out the most numerous and useful applications. Hence, in this light, steam-power is to be judged of not merely as a *motive power*—which water can as cheaply perform, or which, some day, electro-magnetism* may, perhaps, as cheaply effect—but as possessing advantages *per se*, which I shall attempt shortly to point out. The boiler of the engine, which ought to be no longer than really required to give *steam enough* to prevent waste of fuel in winter, must be daily regularly heated, and then either steam from it, or hot water, as may be required, is to be obtained for preparing food for cattle. It is likewise to be made equally available for stable use. The advantages of having hot water *at all times* in stables is appreciated by every gentleman who takes an interest in his stud.† The spare steam can be made easily to heat a complete range of cottages for farm servants, which may be situated in connection with the farm offices as not to be inconvenient.

We have already seen the facility by which the spare steam was made use of, at a very small expense, to heat a drying loft; even the heat of the boiler itself might be of utility for damp grain placed above the boiler shed, as is frequently done for drying-houses of manufacto-

* Although there is little prospect at present of electro-magnetism being brought into use in this country as a moving power of machinery, yet it is stated it has already been brought to considerable advancement on the Continent—and the very ingenious applications of this powerful agent by Mr. Daniels, and others, holds out a decided prospect of its more extended applications. A very clever model of a machine, driven by electro-magnetism, was shown at one of the Highland and Agricultural Society's monthly meetings, by Dr. Aiton of Dolphington, and an interesting account read by him of the application of electro-magnetism to machinery.

† In some stables the whole range of sleeping-lofts or apartments for the grooms were heated, under my directions, by hot-water pipes or steam; likewise water tanks, or cisterns for the stalls, were heated by hot pipes passing through them.

ries. The utility of this plan must not be overlooked in making arrangements for using steam-heat, nor likewise the simplicity by which the same agent could be applied for a clothes-drying house for family use. Nor must we forget the advantages of heating poultry-houses with spare steam-heat, or even the poussiniere, or nursery for egg-hatching. Nor is this chimerical—the poussiniere of M. Bonnemain, invented fifty years ago, heated by hot-water pipes, or steam, we are told, was found to be an ingenious and profitable establishment; and this plan, as old as the Egyptians, while it has been revived within these few years, affords to the busy housewife, where her spouse has laid out a few pounds on the erection of a steam-engine, or steam-mill as it is called, or boiler, an ample supply of heat for bringing chickens in winter into market, to reward her with a profitable investment. The above are merely a few things of the many this powerful agent can be made to do, even on a small scale; nor must I forget, for the housewife, the washing-machine, both *driven* by steam-power, and *supplied* with steam, and other excellent applications of steam, many of which will be found described (as they have been practically applied) in Silvester's Domestic Philosophy.

The great distance to which steam can be conveyed from the boiler would excite surprise to those who have never seen it; hence there could be no difficulty in applying it, in addition to what is stated, to many horticultural purposes—such as warming a hot-house and conservatory, and pine or melon pits, or even forcing land, or garden ground. The daily new inventions and purposes to which it is applied point out an inexhaustible field for extension.

But the utility of the steam-engine is not practically exhausted: the boiler chimney could be made of the greatest utility for an important purpose—*ventilation*—a thing so much neglected in most arrangements. The whole range of stables, cattle-sheds, and even piggery, grain lofts, &c. could be brought under a perfect system of ventilation by the fire draught, by means of metal or wooden pipes, or brick or stone flues, communicating with the ash-pit of the furnace—a plan which has been long known,* yet so little practically made available. The importance of ventilation to stables, though generally admitted, is frequently neglected. Although we have many examples on record, especially in horse-barracks in the army, of the evil consequences of bad ventilation—as all animals, when confined, rapidly destroy the atmosphere, both by respiration and secretitious exhalations from the skin—producing carbonic acid, and other ammoniacal and mephitic gases. Hence the lower animals require *even more air* in the same ratio than the human race; and, to keep horses, cattle, poultry, sheep, pigs and dogs in a healthy condition, and free from cutaneous diseases, when much confined, besides wholesome food, a constant renovation of the air should go on: and even in stables, if heat is required, which it must be, it is surely better to provide artificial heat, by passing a steam-pipe through the stable, than by enclosing the animals in a loose box heated by their own exhalations, or by closing the stable up, to allow them, as it is termed, to draw heat from one another. I do not think sufficient attention is ever paid, in the construction of stables and cattle-houses, to the necessity of ample *light* as well as *air*. The effect of want of light on vegetables and plants is so well known that there can be no doubt light is equally required for the health of man and the lower animals. In addition to the stables, &c. the same range of cottages which I have shown could be so easily heated with spare steam, or hot water, from the engine-boiler—could, with equal effect, be ventilated by flues drawing or sucking out the impure air to the furnace—or if the fire draught was found inconvenient, or thought objectionable, as has been said, for "attenuating the air," then the wind fan could be driven by the steam-engine, to effect the same purpose. In all and every case to which ventilation is applied, whether to suck out the impure air from cottage or stable, provision is to be made for the inlet of fresh air, as well as the escape of impure air. Thus, with a little expense in the first arrangement, farm-house, cottages and offices could be placed under a thorough system of ventilation—under perfect control; and the same agent which effected this would supply, without more cost for fuel, an ample supply of heat to warm with salubrity many cottages; even ample supplies of warm air, if preferred, heated by steam, might be distributed, thereby increasing the comfort of the cottage fire or the farmer's hall.

In addition to all this, an agent so accessible as the engine chimney might be applied to other useful purposes—to preserve the roof and timbers of the buildings, as well as so contrived that a flue from each stack in the yard might create a circulation of air in wet weather, and prevent the heating of the grain in the stack.

I might pursue this subject still farther, but I am well aware that even much of what I have already suggested the farmer may be apt to regard as chimerical, and inconvenient for him to adopt in practice. This I am prepared to expect. But opposition of this kind goes for nothing. It is like the slow-sailing ship in the wide sea, which is soon distanced by more active competitors. When we remember the state of the Scottish farms of old, and contrast them with the improved state of modern tillage, and knowledge of chemical properties of soils and manures, we may observe what a few years have already produced, and what a prospect of progressive advancement is still held out. I agree with Mr. Babbage "that Science and Knowledge are subject, in extension and increase, to have effects quite opposite to those which regulate the material world: the farther we advance from the origin of our knowledge, the larger it becomes, and the greater power it bestows upon its cultivators to add new fields to its dominions. . . . The mind contemplates the past, and feels irresistibly convinced that the whole already gained bears a constantly diminishing ratio to that which is contained within the still more rapidly expanding horizon of our knowledge. . . . The experience of the past has stamped with the indelible character of truth the maxim that '*knowledge is power*.'"

[Journal of High. and Ag. Soc. of Scotland.

Burnt Cream.—*Prep.* Cream, 1 quart; cassia, a small stick; the peel of half a lemon; boil for 5 minutes; let it cool a little and take out the spice; then add the yelks of 9 eggs, and sugar to sweeten; stir until cold, put it into a dish, strew powdered sugar over it, and bake it until brown.

* See an account of this, in a paper read by the writer before the Royal Society of Arts, 10th April, 1843; and printed in the Society's Transactions.

REARING CATTLE.

THE REARING OF CATTLE, WITH A VIEW TO EARLY MATURITY, AS PRACTICED IN BERWICKSHIRE, ENGLAND.

BY MR. JOHN WILSON, EDINGTON MAINS, BERWICKSHIRE.

THE valley of the Tweed has long been famed for the rearing and fattening of cattle, its rich pastures, warm turnip-soils, and proximity to England, affording peculiar facilities for prosecuting this branch of rural economy. The "Short Horns" were early introduced into it, and soon became its established breed; and, though still inferior to the Tyneside herds in symmetry, color, and grazing quality, yet nowhere, perhaps, are they brought to market, at two years old, in such perfection of weight and fatness.

The production of beef, at the quickest and cheapest rate, being the object in view, the first requisite is a stock of cows possessing qualities suitable for this purpose. Accordingly, they should be good milkers—able to keep at the rate of two and a half to three calves each—of a kind known to have a tendency to fatten readily, and to come early to maturity, and of a structure likely to produce a vigorous, well-grown steer. In other words, they must be good Short-Horns; only having more regard to their milking properties than is usually done by breeders of bulls. And here it may be well to notice, that it is in general highly inexpedient for the beef-grower; the farmer who depends largely on his regular cast of fat cattle—to attempt breeding his own bull. *It is only a few individuals in any district who have the taste and skill requisite for this difficult department of the business, not to mention the large capital which must necessarily be invested in it, the precariousness of the return, the greater liability to casualties of such high-bred animals, and the additional expense of their housing and maintenance.* On Tweed-side, the breeding of bulls is confined to a very limited number of persons, chiefly Northumbrians, who, by devoting their whole attention to this department, are able, from year to year, to furnish a class of bulls which are steadily improving the general breed of the district. The contrary practice is at this moment compromising the character of this valuable breed of cattle in several districts of Scotland into which they have been more recently introduced. *Made wiser on this point by experience, the farmer of the Border purchases from some breeder of established reputation a good yearling bull, which he uses for two or three seasons, and then replaces by another in like manner.* This bull serves his own cows and those of his kinds, and some of the neighboring villagers', and thus, though his own stud be limited to six or eight cows, he can select from the progeny of his own bull as many calves as he requires to made up his lot, and has them more uniform in color and quality than could otherwise be the case. As the male parent, among sheep and cattle, is known to exert by far the greatest influence in giving character to the progeny, and increasingly so in proportion to the purity of his breeding, it is evidently much for the advantage of the beef-grower to *spare no reasonable trouble and expense in obtaining a bull of thorough purity, and then to select his calves with the most scrupulous attention.* From overlooking all this, how often may cattle be seen, on the best of land, too, which can only be fattened at an enormous expense of food and time, and after all, are so coarse in quality as to realize an inferior price per stone. Occasionally a few beasts of the right sort will seen in such lots, which, by going ahead of their fellows, to the extent of £4 or £5 a-piece of actual market value, show what might have been done by greater skill or attention on the part of the owner.

It is very desirable to have all the cows to calve betwixt the 1st February and 1st April. If earlier, they will get almost dry ere the grass comes, and calves later than this will scarcely be fit for sale with the rest of the lot. When a calf is dropped, it is immediately removed from its dam, rubbed dry, with a coarse cloth or wisp of straw, (this being what the cow would do for it with her tongue, if allowed,) and then placed in a crib in the calf-house among dry straw, when it receives a portion of its *own mother's* first milk, which, being of a purgative quality, is just what is needed by the young animal. For a fortnight, new milk is the only food suitable for it, and of this it should receive a liberal allowance thrice a-day; but means should now be used to train it to eat linseed-cake and sliced Swedish turnip; and the readiest way of doing so is to put a bit of cake into its mouth immediately after getting its milk, as it will then suck greedily at anything it can get hold of. By repeating this a few times, and placing a few pieces in its trough, it will usually take to this food freely, and, whenever this is the case, it should have as much as it can eat, that its allowance of milk may be diminished, to meet the necessities of the younger calves which are coming in succession. This is of the greater importance that it is always most desirable to avoid mixing anything with their milk by way of helping the quantity. When a substitute must be resorted to, oatmeal porridge mixed with the new milk is perhaps the best. Sago of late years has been much used for this purpose; but an eminent English veterinary surgeon has recently expressed a very decided opinion that its use impairs the digestive powers of the animal and predisposes to disease. The sour smell invariably found in a calf-house, where porridge or jelly of any kind is mixed with the milk, is proof sufficient that indigestion is the consequence. An egg put into each calf's allowance, and mixed with the milk by stirring with the hand, is a good help, and never does harm; but, with this exception, it is best to give the milk warm and unadulterated, however small the quantity, and, along with this, *dry* farinaceous food, turnips and hay, *ad libitum*. If more liquid is needed, a pail with water may be put within their reach, as this does not produce the bad effects of mixed milk. Indeed,

in this, it is the best to keep as closely as possible to the natural arrangement according to which the calf takes its suck—at first frequently, and then at longer intervals, as it becomes able to eat of the same food as its dam.

The diet of the cows at this season is a matter of some consequence. Swedish turnips yield the richest milk, but it is too scanty, and calves fed on it are liable to inflammatory attacks. Globe turnips should, therefore, form their principal food during the spring months. Care must also be taken that they do not get too low in condition in the autumn and winter, and for this end it is well to put them dry *at least* three months before calving. Some may think this long; but, but, on a breeding farm, milk is of little value this season. The cows, when dry, are kept at less expense, and, by this period of rest, their constitution is invigorated, greater justice done to the fœtus, now rapidly advancing to maturity, and so much more milk obtained after calving, when it is really valuable.

When the calves are from four to six weeks old, they are removed from their separate cribs to a house where several can be accommodated together, and have room to frisk about. So soon as the feeding-yards are cleared of the fat cattle, the calves are put into the most sheltered one, where they have still more room, and are gradually prepared for being turned to grass; and, when this is done, they are still brought in at night for some time. At six weeks old, the mid-day allowance of milk is discontinued, and at about fourteen weeks they are weaned altogether. When this is done, their allowance of linseed-cake is increased; and, as they have been trained to its use, they readily eat enough to improve in condition at this crisis, instead of having their growth checked, and acquiring the large belly and unthrifty appearance which used to be considered an unavoidable consequence of weaning.* The cake is continued until they have so evidently taken with the grass as to be able to dispense with it. They are not allowed to lie out very late in autumn, but, as the nights begin to lengthen and get chilly, are brought in during the night, and receive a foddering of tares or clover foggage. When put on turnips, the daily allowance of cake, say 1 lb. each) is resumed, and continued steadily through the winter and spring, until they are again turned to grass.—This not merely promotes their growth and feeding, but (so far as the experience of five or six years can determine the point) seems a specific against black-leg, which was often so fatal as altogether to deter many farmers from breeding. It may be well to state here distinctly the particular purpose for which cake is given at the different stages of their growth. At first, the object is to accustom them to a wholesome and nutritious diet, which will supplement the milk obtained from any given number of cows, so as to admit of a greater number of calves being reared, and, at the same time, have greater justice done them than could otherwise be practicable. At weaning-time, again, it is given to help the young animal over the transition from milk to grass alone, without check to growth or loss of condition. During the following winter, however, the special object of its use is to prevent black-leg, as, but for this, turnips *ad libitum* would be sufficient.

When put to grass as year-olds, they decidedly thrive better on sown grass of the first year than on old pasture, differing in this respect from cattle whose growth is matured. They are laid on turnips again as early in the autumn as these are ready; and it is a good practice to sow a few acres of globes to be ready for this express purpose. It does well to give the turnips upon the grass for ten or fourteen days before putting them finally into the feeding-yards; and then, if they can be kept dry and warm, and receive daily as many good turnips as they can possibly eat (globe till Christmas and Swedish afterward,) they will grow at a rate which will afford their owner daily pleasure in watching their progress, and reach a weight by the 1st of May which, if markets are favorable, will reward him well for all his pains.

The leading features of this system are, *uniform good keeping* and *progressive improvement*; in other words, to get them fat as soon after birth as possible, and keep them so till they reach maturity. The details given above are a description of the expedients generally adopted by the breeders of this district for securing these objects. [Jour. of High. & Ag. Soc. of Scot.

* Corn meal would probably answer with us where the linseed cake is not to be had. [*Ed. Farm. Lib.*

LIQUORICE.

To John S. Skinner, Esq.
Editor of the Farmers' Library:

In the March Number of the Farmers' Library, you state that there is "room for inquiry and need for information about Liquorice." It belongs to the natural order *Leguminosæ* of Botanists, or that tribe of plants which have blossoms and pods like the common pea. Its botanical name is *Liquoritia officinalis*. It is a deep-rooting perennial, and has long been much cultivated in Spain; and, according to Loudon, since Elizabeth's time has been grown in different parts of England; hence there is little doubt but that it would succeed well in this country.—Loudon says:

"The soil should be a deep sandy loam, trenched by the spade or plow, or with the aid of both, to two and a half or three feet in depth, and manured if necessary. The plants are procured from old plantations, and consist of the side-roots, which have eyes or buds. These may be taken off, either in autumn, when a crop of Liquorice is taken up for use, and laid in earth till spring, or taken from a growing plantation as wanted for planting. The planting season may be either October or February and March. In general the latter is preferred. The plants are dibbled in, in rows three feet apart, and from eighteen inches to two feet in a row, according to the richness of the soil. The after-culture consists in horse-hoeing and deep stirring, in weeding, and in cutting over and carrying away the haulm every autumn, after it is completely withered. As the plants do not rise more than a foot the first season, a crop of onions or beans is sometimes taken in the intervals. The plants must have three summers' growth, at the end of which the roots may be taken up by trenching over the ground. The roots are immediately sold to the brewers' druggists or to common druggists, or preserved, like carrots or potatoes, in sand till wanted for use. They are used in medicine and porter-brewing."

Yours truly, S. B. BUCKLEY.

Yates Co. N. Y. March 16, 1846.

SALT—A FERTILIZER.

BY C. N. BEMENT.

We take pleasure in transferring to the columns of the Farmers' Library, from the American Quarterly Journal of Agriculture, the following valuable article on the use of Salt as a Manure:

The value of salt for agricultural purposes has long been known, both in Europe and in this country; and why it has not been more generally used is beyond my comprehension. More than one hundred and fifty years ago, Sir Hugh Platt, an eminent writer of that day, speaks very decidedly of the benefits which might be derived from the practice of sprinkling salt upon land, and calls it the "*sweetest* and *cheapest*, and the most *philosophical* of all others." He relates the case of a man who, in passing over a creek on the sea-shore, suffered his sack of seed corn to fall into the water, and that it lay there until it was low tide, when, being unable to purchase more seed, he sowed that which had been in the salt water, and, when the harvest time arrived, he reaped a crop far superior to any in the neighborhood. The writer adds, however, that it was supposed the corn would not fructify in that manner unless it actually fell into the water by chance; and, therefore, neither this man nor any of his neighbors ever ventured to make any farther use of salt water.

The same curious writer tells also of a man who sowed a bushel of salt, long since, upon a small plot of barren ground, and that to that day (the time he was writing) it remained more fresh and green than any of the ground round about it.

Dr. Brownrig, who wrote more than a century ago, in speaking of salt says, "it is dispersed over all Nature; it is treasured up in the bowels of the earth; it impregnates the ocean; it descends in rains; it fertilizes the soil; it arises in vegetables; and from them is conveyed into animals."

In the neighborhood of the salt works in Great Britain, the value of salt as a manure is well known and acknowledged; "that when wheat and barley have followed turnips, on land which had been salted, the ensuing crop has invariably escaped mildew, although that disease had affected all the grain upon the lands adjacent, on which salt had not been used."

It has been asserted that salt is the mother of all manures, as every kind of manure is higher or lower in value according to the salt it produces; and every kind of manure is portioned out to the land according to the quantity of salt or nitre it is thought to contain.

"Nothing in Nature," said Hollingshead, "is so powerful as salt to meliorate strong and stiff soils, and also to give moisture to dry ground; it is also a certain destruction to weeds and insects. Besides its efficacy on corn and fallow-ground, its excellent qualities, in giving luxuriance and salubrity to grass lands, are peculiarly worthy the attention of the grazing and breeding of cattle."

"Soils," says an old writer, "which are subject to the grub, and must be fertilized by common dung, which is a proper nest for the mother-beetle to deposit its eggs, must be well impregnated with the brine of dissolved salt, after the dung is first cut up."

The efficacy of salt in destroying noxious weeds, grubs, and insects, is well known, in all parts, but a dose sufficient to kill weeds, would also destroy the cultivated crops; therefore, great attention and caution should be taken in not applying too much when intended to fertilize the soil.

As to the quantity of salt which it would be advisable to use per acre, for the respective crops and upon the different kinds of land, will be best learned by instituting a set of experiments upon every distinct species of grain and roots. Cold, wet land requiring more, and loose, light land, though it be poor, requiring less.—Four bushels to the acre, harrowed in after plowing, has been found a sufficient quantity on most soils, for corn and potatoes, but the best way of all others for ascertaining this point, would be for every one to depend upon the results of his own experiments.

To ascertain the exact quantity of salt which may be necessary for the different kinds of land, and to appreciate the benefits which result from its employment in all the various modes of culture adopted in this country, will require several long series of experiments; we would, therefore, suggest to the Executive Committee of our State Agricultural Society, that they offer rewards to such persons as shall give them an account of the best experiments with this mineral substance, in the different branches of farming and general Agriculture.

The safest way for a farmer to adopt, is to use his salt sparingly at first, and in all cases to leave a small portion of the same land without salt, so that the real effects produced by the salt may be, by comparison, in every instance, self-evident and palpable.

That salt is an excellent manure, experience, the most satisfactory of all evidences, clearly proves.

It is stated in an English publication, that "a farmer in the county of Sussex, some years since, had a field, one part of which was very wet and rushy, and that grass produced upon it was of so sour and unpleasant a kind that the cattle would not graze upon it; he tried several methods to improve it, but to little purpose; at last having heard of the benefits of salt as a manure, he determined to try that; for which purpose he procured a quantity of rock salt, which in a random way, without any regard to the precise quantity, he threw upon the rushy ground, fencing it off from the other part of the field, the effect of which was a total disappearance of every kind of vegetation. In a short time, however, it produced the largest quantity of mushrooms ever seen upon an equal space of ground in the country. These, in the spring following, were suc-

ceeded by the most plentiful and luxuriant crop of grass, far exceeding the other part of the field in richness of its verdure and the quickness of its growth; the cattle were remarkably fond of it, and though the salt was laid on it twenty years before, this part is still superior to the rest of the field."

An interesting detail, from Rev. E. Cartwright, will be found in the 4th volume of Communications to the Board of Agriculture (England), which is conclusive as to the application of salt as a manure for potatoes. It appears from this communication that the experiment could not have been tried on a soil better adapted to give impartial results. Of ten different manures which were resorted to, most of them of known and acknowledged efficacy, one only excepted, salt was superior to them all. Its effects, when combined with soot, were extraordinary, yielding in a row two hundred and forty potatoes, while one hundred and fifty only were produced from the row manured with lime. It was observable also, where salt was applied, whether by itself or in combination, the roots were free from that scrubbiness which often infects potatoes, and from which none of the other beds (and there were in the field near forty more than made part of the experiments), were altogether exempt. So much for foreign experiments; now let us see what has been done in this country.

From the information which I have been enabled to collect, I am inclined to believe that salt, when sparingly applied, is valuable as a fertilizer, and useful in destroying the grub and wire-worm, which often injure, and sometimes even destroy whole crops; and it has been found by experiments the past season, that the scab, or disease which has proved so disastrous to the potato crop in all sections of the country, has never been found upon land that had a proper dressing of salt.

Mr. Hamilton, of Schoharie, informed the writer that he had found great benefit from using salt on his potato ground last spring. After plowing, he caused four bushels of salt to be sown, broadcast, on the furrow, upon one acre of the field and harrowed in. Potatoes were then planted. Part of the field was not salted. Although the season was remarkably dry, the salted acre was observed to maintain a green, vigorous appearance, while the other part of the field looked sickly and stunted. On lifting them in the fall, those potatoes where salt had been applied were of good size, smooth skin, sound, and of good quality, and yielded a fair crop, while those on the unsalted part of the field, although the soil was fully equal to that of the salted portion, the yield was considerably less, potatoes small, and much eaten by worms.

His neighbor had a field of potatoes on the opposite side of the road, soil similar to his own, who planted them the usual way, and the consequence was, his crop was small, inferior in quality, and most of them rotted soon after digging—they were diseased.

Dr. Bogart, who has charge of the Sailor's Snug Harbor on Staten Island, informed the writer that he applied four bushels of packing salt to one acre of his potato ground, last spring, and thinks he derived great benefit from it. Though the crop was not a large one, the potatoes on the salted portion were of much greater size, skin smooth, and free from disease. The vines were more vigorous, remained green while those on land of the same quality adjoining, which was not salted, shriveled and dried prematurely; the tubers small and watery; produce less.

E. M. Stone, in a late number of the N. E. Farmer, says:—"Last spring I tried an experiment on potatoes. I planted in my garden fifty or sixty hills, placing the sets directly on the manure. To about one-half of the hills I applied a table-spoonful of salt, after slightly covering the seed to prevent immediate contact. I then finished covering. The hills so treated yielded potatoes entirely free from blemish, and of excellent quality. The produce of the residue was badly affected by rust (or scab) and worms, and was hardly worth harvesting."

Professor Morren also directs attention to the importance of salt as a means of repelling the disease. He recommends the tubers to be placed in a steep composed of 54 lbs. of lime, 7 lbs. salt, and 25 gallons water.

Mr. J. E. Teschemacher, speaking of the potato disease, in the N. E. Farmer, says:—"I think that salt, lime, and several chemicals will destroy the disease. I prefer salt, because when mixed in the soil, it may get into the juices, and circulate through the whole plant. Lime, or lime-water, would do the same, to a certain extent, but it is far less soluble than salt."

The following very interesting detailed experiment with salt was communicated in the 9th Vol. and 5th No. of the Cultivator, by J. C. Mather, a very intelligent and spirited farmer of Scaghticoke. He says:—"In the spring of 1838, we broke up six acres of sward land that had been mowed a number of years, intending to plant it to corn, but observed, when plowing, that the ground was infested with worms, (the yellow cut, or wire-worms, and black grubs;) as we had mostly lost our corn crop the year previous, by having the first planting almost entirely destroyed by the corn worm, (above described,) we expected a like calamity would follow the present year, unless some preventive could be used to destroy the worms. And having frequently and unsuccessfully used all the recommended remedies to destroy the corn worms, we were induced, at the suggestion of an English laborer, to try salt. After the ground was thoroughly harrowed, five bushels of salt per acre were sowed broadcast, leaving a strip of near half an acre on each side of the field, to satisfactorily test the experiment. The whole was then planted to corn and potatoes. The corn on the part where no salt was sown was mostly eaten up by the worms, and was replowed and planted to potatoes. The potatoes on the whole lot were a good crop, but decidedly better where the salt was applied. I regret that we did not ascertain by measurement the actual result. There was a very perceptible difference in the appearance of the vines during the whole summer. On the part where the salt was sown, they grew larger and were of a darker green color, and continued green longer in the fall than the others."

"In the spring of 1839, we spread on a good coat of manure, and planted it all to corn, except about half an acre of the salted land, which was planted to Rohan potatoes. The Rohans were the best crop of potatoes I ever saw. Seed planted, 2½ bushels, produce over 300 bushels. The largest potatoes weighed 4¾ lbs. The corn was a heavy crop, but was not measured. The summer was very dry and hot; but the corn on the salted land did not appear to suffer at all from the drouth, while the other was consider-

ably injured. The salted land appeared always moist, and the growth of everything upon it was very rapid. We found great difficulty in keeping the weeds down. After three successful hoeings, we were obliged in August to give it a hand weeding. Spring of 1840, intended to have stocked the land down for meadow; but thinking it too rich for oats, planted potatoes without manure. Crop good. The effects of the salt still very apparent. Adjudged to be one-third more potatoes where the land was salted."

"Spring of 1841, sowed a part of the lot to oats, the remainder to potatoes and onions, without manure. The onions were a great crop. The summer was very dry, but they did not suffer, while other crops in this neighborhood, on similar soils, were nearly destroyed by the drouth. The oats were a heavy crop, and much lodged on the salted part. The clover grew well, and produced a fine crop of fall feed. This I cannot account for, except by supposing that the salt kept the land moist, or attracted moisture from the atmosphere, as I know of no other piece of land in the town that was well seeded last year: it was almost an entire failure; and the most of the land stocked down last spring has been or will be plowed up in the spring to be seeded.

"We sowed salt the same spring on a part of our meadows. The grass was evidently improved, the result satisfactory, and we shall continue to use it on our meadows."

At a farmers' conference meeting, held at Marcellus, Onondaga County, in November last, Mr. Brown, President of the County Agricultural Society, said, "he had used salt as a manure with great benefit. He sows it broadcast upon wheat and grass at the rate of three to five bushels to the acre. On grass he would sow it in the fall —for wheat he would sow it just before the wheat is sown. He found that three bushels of salt to the acre on his wheat field, occasioned an increase of seventeen bushels of wheat to the acre over that which had no salt. The soil was a strong loam with a stiff subsoil."

Cuthbert W. Johnson, a distinguished agricultural writer, strongly recommends salt as a manure, at the rate of from ten to twenty bushels to the acre, to be sown some two or three weeks before the seed is put into the ground. He says the benefits are as follows: 1st. When used in small quantities it promotes putrefaction. 2d. By destroying grubs and weeds. 3d. As a constituent on direct food. 4th. As a stimulant to the absorbent vessels. 5th. By preventing injury from sudden transitions of temperature. 6th. By keeping the soil moist."

It would seem from all the facts I have been able to collect, that salt corrupts vegetable substances when mixed in small quantities, but preserves them when it predominates in a mass; that in dry seasons its effects are more apparent, and whether it attracts moisture from the atmosphere, or whether it acts as a stimulant or condiment, is of little consequence so long as its effects are certain.

On account of the small quantity of salt, in weight, required for manuring lands, it is no inconsiderable recommendation, because on that account it may with ease be conveyed to the most rough, steep and mountainous parts, to which the more bulky and heavy manures most in use could not be carried, but with infinite labor, and at an expense far exceeding all the advantages to be effected from it.

For a top dressing, a composition of salt and lime, 4 bushels of the former and 12 of the latter, to the acre, has been highly recommended for grass lands infested with moss, and promoting a more vigorous growth of grass. Its beneficial effects on asparagus beds are well known to gardeners, giving a deeper color and a more vigorous growth to the plants.

Salt itself is considered, by some, rather too harsh in its nature, but mixed with ashes, say six of dry ashes to ten of salt, well mixed together, which is sufficient for an acre, and spread upon the furrow and harrowed in. By being thus mixed, one particle incorporates and mollifies the other, and if conveyed into the earth by a soapy, smooth method, will prove the real enricher the earth wants, to send forth vegetation.

MANAGEMENT OF MANURE.

It is always best when made under shelter, and perhaps no better can be made, other things being equal, than in Mr. Warnes's system of box-feeding, where the litter accumulates under the animal, and is applied in quantity sufficient to absorb *all* the urine. It is surprising what a quantity of excellent manure may thus be made. An ox in a box 10 feet square, and well littered every morning, will rise in its shed only about three inches a week, but the manure below it is hard, compressed, and will monthly, when turned out, form a heap of at least six cubic yards of first-rate material, containing, as it does, the whole of the urine. We clean out our boxes monthly, cart the materials to heaps in the fields for our turnips and other root crops; and in turning it over mix and cover it well with the earth on which it is laid. It is taken always to that part of the field where there is the thickest soil, that the land may not suffer from being thus robbed. The sheep-dung, the sheep being fed under sheds, is allowed to accumulate for a month also, and is taken away to heaps in like manner. The stable-dung, and that from the cattle stalls cleaned out every day, is taken to a heap by the liquid-manure tank, with the contents of which it is soaked whenever the tank is full, and it is also well soaked when it is carted away in spring to the field. Dung, as we understand, does not contain, *when perfectly fresh*, much ammoniacal matter, but it contains that (mucous matter and urea) which forms (chiefly carbonate of) ammonia during the process of putrefaction which almost immediately ensues; and it has been contended that if spread out in the field, when perfectly fresh, on the surface, or at most under a very slight covering of earth, its nitrogen compounds would form nitrates, and not compounds of ammonia, and thus be as available as vegetable food, with less risk of waste. Nitrates are very rarely found in our soils, and that is against the theory, but the doctrine is nevertheless a fair subject for experiment, and to test it, when clearing out the cattle boxes, let, say 30 tons, be spread at once on an acre of plowed stubble for the Swede crop of the ensuing season, and another 30 tons put in a heap on the land and turned, mixing with earth, &c. according to rule, and then in April or May plow it in on an adjoining acre—the resulting crop, if managed alike in every other respect, will tell the truth on *this* point. Farm manure may be considered, on the average, as containing about 10 lbs. of nitrogen in the ton; this, in the ordinary

course of putrefaction, will form about 23 lbs. of carbonate of ammonia, to fix the ammonia of which requires 35 lbs. of the sulphuric acid of commerce; it will, however, be safer to use a smaller quantity, and it may be thrown among the liquid manure with which you soak the heap; 70 or 80 lbs. per ton of the common green vitriol will answer the same purpose, and as for sulphate of lime (gypsum), which is to a certain extent a fixer of ammonia, it may be well to apply an excess of that, as it has a value of its own as a manure; 1 cwt. of it may, therefore, be mixed per ton of the manure. Farm dung should be turned once and mixed with earth shortly after being carted out to the field in this month, and then again three weeks before it is applied: the first turning will cost 1d. and the second ½d. per cubic yard, measured *before* turning.

Liquid manure may be applied either by soaking manure heaps, or it may be hoarded up in tanks till spring and carted out in water-carts on the land—in the latter case it may be well to *fix* the ammonia, which, when putrefying, it contains. And to guide to the economical performance of this, we may mention that 17 lbs. of ammonia require about ½ cwt. of the sulphuric acid of commerce for its fixation, and that the same quantity of sulphuric acid is contained in about 1¼ cwt. of sulphate of iron. Now, fresh urine, averaging all that is produced from the various animals on the farm, may be considered to contain about 2 lbs. of ammonia in 10, or 12 gallons, *i. e.* in 100 to 120 lbs.; and the horse yields 3 to 5 lbs., the cow 30 to 40 lbs., and the sheep and pig probably 2 or 3 lbs. of urine daily.

It must not be forgotten that the value of manure depends not only upon its nitrogenous or ammoniacal compounds, but also upon its mineral parts—and it differs greatly in these, according to the food and the age and condition of the animals which produce it. It is believed that the greater value which every farmer recognizes in the dung of cake-fed beasts arises chiefly from the greater quantity of phosphates which it contains—those phosphates being contained in the food of the cattle. And the great difference in the value of their manure between a full grown half-fat ox and a milch cow or a young beast, arises from the latter requiring all the phosphates in their food, one for the growth of its bones, and the other for the secretion of its milk, while the former, requiring them for neither of these purposes, passed them out in its manure. Manure also depends for some of its value on its bulk—its influence on the texture of the soil; but this, while sometimes beneficial, as on clay soils, where it ought to be applied fresh, is sometimes injurious, as on light soils, where, accordingly, it ought to be kept, if this can be done with safety to its volatile ingredients, till it is rotten and of an unctuous texture. It would be beneficial if the terms on which farmers hold their lands were so modified as to allow of their changing the cattle food produced on their farms for any other kind of cattle food they might prefer—they would then be able to buy or to sell straw according as a stiff or a light soil appeared to them to require a bulky fibrous manure, or one of a more condensed and less bulky character, and all this would be attended with benefit, not only to themselves but to their landlords also.

BONE MANURE.

This is one of the manures which appears not to have attracted the notice, or to have gone as extensively into use it ought to do.

It would be gratifying to hear from our friends in Montgomery what have been the results of their farther experience, and to have their opinion of its intrinsic value at the prevailing prices, and their estimate of it in comparison with other manures.

It seems to maintain its ground in England, where the value of all manures has been calculated on the basis of experiments, numerous, varied, and exact to a degree that it would seem to be impossible to carry out in our country.

At a late meeting of a Farmers' Club in England, a paper on the analysis of the soils of Carnwinick Farm—the property and in the occupation of C. H. T. Hawkins, Esq.—was read by Mr. Karkeek, of Truro. Its object was to prove the durability of bone-dust as a manure for a period of ten years. It appears that, in 1835, a piece of waste ground was broken from the common, and tilled to turnips, the larger part of which was manured with bone-dust, at the rate of three quarters to the acre.* In the two following years it was successfully cropped with oats, and with the last crop laid down to permanent pasture, in which state it has remained ever since. At the present period, the effect of the bone-dust can be plainly distinguished—the grass, as far as the eye can reach, having a rich grass sward; while the adjoining part, where no bone-dust has been applied, has a coarse, sterile appearance: the difference being as great as if a line had been drawn between rich pasture and scanty, coarse herbage. This, and a great many other experiments of the same character, made by Mr. Trethewy, the manager of the estate, amounting altogether to 120 acres, and on all of which the effect of the bone was equally visible, induced the Club to send a sample of the soil from each part of the field on which the first experiments had been made, to Mr. Hunt, late of Falmouth, and now "Curator of the Museum of Economic Geology," to be analyzed, in order to ascertain if the bone could be detected at the present time. It should be

* It should be properly added that the whole of the turnip plant was carried off by the fly; consequently, little or none of the bone-dust was used in that crop. This will partly account for its evident durability.

observed that Mr. Hunt was kept altogether ignorant of the object of the Club, and that the result was perfectly satisfactory, inasmuch as he readily detected the bone in that portion of the field, on which it had been applied some ten years before. The following are the analyses:

Substances.	*No.* 1.	*No.* 2.
Water, evaporated by stove drying	14·06	14·18
Vegetable and animal matters burnt off	12·01	12·65
Silica and siliceous grit	49 54	49 50
Oxide of iron	7·03	7·00
Carbonate of lime	1·05	1·06
Carbonate of magnesia	0·25	0·35
Sulphate of lime	1·05	1·04
Muriates	0·54	0·54
Alumina	7·10	6·04
Phosphate of lime	0·10	0·75
Phosphate of magnesia	0·00	0·05
Potash	1·00	1·27
Humus and soluble alkalies	6·00	6·17

Mr. Karkeek contended, from these analyses, that the experiment went to prove a plain and important fact, and one which is considered a disputed question among agriculturists—that the principal manuring properties of bone existed in the earthy matters, which constitute about two-thirds of bone, and not in the oily and glutinous parts constituting the remaining third.—An interesting discussion ensued on the subject of the analyses—the Club being of opinion that the organic parts of bone evidently had a powerful effect as a manure, but that it was next to an impossibility that any other than the earthy matter could have remained so long in the land—the whole of the animal matter having been probably consumed by the two crops of oats; and they agreed with Mr. Karkeek that the principal manuring properties of bone existed in the earthy phosphates.

JERUSALEM ARTICHOKE.

Helianthus Tuberosum, Linn.

We find the following Essay on the culture, properties and value of the *Jerusalem Artichoke*, in a late number of a news and political paper, the South Carolinian. Prompted by his own good taste, the Editor compliments his readers by supposing that information like this may be as acceptable as never-ending *party* disquisitions and abuse of political opponents, and hence his paper is often enriched with suggestions on the subject of Agriculture and Horticulture, far more important and useful to his patrons than such as serve to keep the people in the Country in a state of perpetual and, too often, angry excitement; breeding ill-blood between neighbors who ought to live like brothers, and drawing them off from the improvement of their estates, the education of their children, and the cultivation of their own minds and resources.

It seems to be clear, that besides its value as a provision for other stock, when dug up and preserved, it may be had recourse to with great profit as a *pasture for hogs*.

JERUSALEM ARTICHOKE.

This plant having recently excited some attention among agriculturists as a valuable root crop, we proceed to give a few hints respecting its culture, derived from our own experience, together with some account of its yield.

Although it is called so, it is botanically in no way allied to the Artichoke, but it is of the same genus of the sunflower, which it much resembles. The term Jerusalem is, according to Webster, a corruption of girasole, the Italian name for sunflower; and it derives the appellation of Artichoke from some fancied similarity in the taste of the tubers with the Artichoke bottoms. It is a native of Brazil, and was first carried into England about the year 1620, and before potatoes were so generally in use, was extremely popular as an edible root. Mention is made of it in old agricultural treatises, as the *Canada Potato*, to distinguish it from the common potato, and it was sometimes called the *Virginia Potato*. It was regarded as wholesome, and is of an agreeable taste, though it is never dry and mealy like the potato, being rather moist and soft in its texture, and is nutritious. Being hardy and perennial, it succeeds in almost all kinds of soil. It was almost lost sight of in Agriculture, until within a few years. Latterly it is obtaining notice as an article of food for domestic animals.

Twelve or fifteen hundred bushels have been obtained from an acre, when properly cultivated, and being relished by horses, cattle and hogs, it is undoubtedly the most profitable root crop which can be planted in the South; and perhaps it might succeed in more northern regions. It is rich in farinaceous substance, and all animals do well and improve when fed upon them. Last spring a friend sent us a quart of tubers. We did not think this small quantity worth planting, as they were much injured and dried up by long exposure. On the third of May, fully two months after they should have been planted, we had a small space of ground, about two rods, prepared, and put them in. A drouth ensued, and they did not come up soon, and consequently lost a great deal by their being so late. They were planted in drills two and a half feet apart, and twenty inches in the drill; but the seed being so badly injured, the plants were very irregular. They were plowed once, and the grass and weeds afterward removed with the hoe. In November we had them plowed up, and upon gathering them found we had ten bushels; and it is our opinion that, if they had been picked clean from the land, the yield would have reached twelve bushels. The tubers filled all parts of the soil, and some of

them are two feet long, consisting of small bulbs connected by succulent roots.

The roots are white, and extremely tender, while the tubers are slightly tinged with red. The roots make the best slips for planting, and, if cut up, leaving an eye to each slip, they readily vegetate. When it is intended to feed this crop to hogs, they require no harvesting, for they readily withstand our mild winters; and if the hogs are turned in on them they usually provide for themselves. For calves, sheep and horses, they must be gathered and washed, but, unlike other roots, they require no cutting up. They might be fed to sheep, by merely plowing up a few daily, and letting the sheep eat them immediately from the ground. In consuming this crop, the hogs gave the ground a thorough plowing, and by turning under the stalks and leaves, they add much to the soil. Some have asserted that it is an exhausting crop, but from the genus of the plant we infer it is not. The leaves are large and the stalks are crowned with beautiful yellow flowers.

The above was substantially the contents of an article contributed by us to the *Albany Cultivator*, for February, 1845. In the spring of 1845, in preparing the plat of ground spoken of, for potatoes, more than six bushels of tubers were gathered, (making the yield sixteen bushels), which had not been affected in the least by the frost, and vegetated finely. The ground was planted in potatoes, but there still remained innumerable small tubers of Artichokes which had not been gathered and these vegetating brought up a fine stand before the potatoes came up. They took possession of it, and instead of a crop of potatoes, one of Artichokes was raised, which produced the second year over twenty bushels on the ground above mentioned. Our experience of the prolific nature of this plant does not cease with the two instances above mentioned. Several acres were planted in a peach orchard at Pomaria, last year, and under all the disadvantages of dense shade, drouth, and exhausted soil, they produced quite a fine crop; and its adaptation as food for swine has been fully tested. A number of sows and pigs are now running on this last-mentioned lot, and keep fat on what they glean from the field, which has been partially dug over, without a particle of other food. It is a great promoter of milk in all animals, and fully sustains the opinion above expressed concerning its being good food for cows and sheep. It would, perhaps, supply better food for ewes and lambs than any other root crop we could grow, as the tubers are extremely succulent and embody more farinaceous matter than is usually allowed to it, by those persons who wish to discountenance its culture, because the Artichoke happens to contain 76-100 parts of water. The great quantity of this constituent renders it the very best article which we can give to our stock, in conjunction with the dry food which we feed out in winter. This is wisely ordained by the Creator, who with the powers and mightiness of omniscience has thus constituted vegetable substances, in order that they may be fit and proper food for the beasts of the field without the artificial aids of preparation, which man is forced to apply to the articles of his diet. Owing to the large yield of this root, we are fully satisfied that one acre of it *will furnish more farinaceous matter* than an acre planted in any other root crop. The Jerusalem Artichoke contains *one-third* more nutriment than the beet, which is extensively cultivated in France as an article of economical food. It will compete and far exceed the yield and profit of the carrot in our soil, being more nutritious, and at the same time more productive; it will grow luxuriantly on soils too poor for the different families of the potato, the beet or the carrot, and we have tested its powers of withstanding drouth and cold; for our crop grew well amidst the desert heats of the last summer, and the roots which remained in the ground during the late severe winter, have not been injured in the least; while it is never attacked by insects or disease, both so fatal to the interests of root crops in the southern latitudes. We believe, from a fair trial, that it is destined to take the first rank among cultivated roots, and finally work great changes in the economy of feeding domestic animals. The shading of old worn-out lands by a plant which lives from atmospheric sources, should be sufficient inducement for its general cultivation. Yvard, the distinguished agricultural Professor at Alport, recommended its cultivation both by precept and example. Arthur Young affirms the net profits of its cultivation to be much greater, beyond all doubt, than that of any other ordinary agricultural production; and finally, it remains in full production on the same spot for ten years and upward.

Our experience induces us to prepare the land and plant them as follows: Break up the soil as deep as you can in the winter, either with turning, Eagle, or subsoil plows; as soon as the frost is out of the soil, in February or March, cross-plow it with the common twister or corn plow, so as to have the land perfectly friable; lay it off in rows two feet apart, and drop the tubers, prepared for planting by being cut into pieces, ten inches apart in this row; cover them with a plow. When the plants are ten inches high plow them over, following again when they become twenty inches high and the crop is made. They grow well in any soil, and being a hardy perennial, flourish for a score of years on the same soil. They can be eradicated by hogs, but will always come, even after the hogs have gleaned the field, in sufficient quantities to make a crop the next year. After the first year, *instead* of *planting them*, they must be plowed down to a stand by three or four workings as soon as they come up in the spring.

CEMENTS.—A correspondent in an English paper says: 'A Subscriber' asks if India-rubber can be successfully used to render slate cisterns water-tight. I can recommend a cement which he will find to answer his purpose. I have known it used in the formation of an aqueduct 450 feet long and 5 feet wide, which was water-tight the whole length. It was lined with flooring-tiles, set in the following cement:

Cwt.	*qrs.*	*lbs.*		*s.*	*d.*		*s.*	*d.*
1	0	0	Whiting, cost, at	4	0	per cwt.	4	0
0	2	18	Rosin, "	11	0	"	7	0
0	0	18½	Brimstone, "	21	0	"	3	10
0	0	9	Tar, "	4	6	"	0	5
1	3	17½	Cost.....				15	3

EXTRACT OF PEACH BLOSSOMS.—Essence of lemon 1 oz.; *pure* balsam of Peru and essence of bitter almonds, of each 1 dr.; bitter almonds 1½ lb.; rectified spirit of wine 3 pints; spirits of orange flowers 1 pint; spirit of jasmine ¼ pint; macerate. Very odorous.

[Cooley's Cyclo. of Prac. Receipts.

EXPERIMENTS IN GROWING POTATOES.

CONEWANGO (near Warren), Pa.
March 18, 1846.

JOHN S. SKINNER, Esq.

Editor of the Farmers' Library:

IN the December Number of the FARMERS' LIBRARY, you remark that you have never known a period when two subjects engrossed as much of the public attention as did the potato disease and the railroad mania in England.—You seem to think, however, that the potato disease does not prevail with us to an extent sufficient to justify the appropriation of much space (where space is so precious), but that it may be well to keep inquiry alive, &c.

With this view of "keeping inquiry alive," I communicate some experiments which I made last season. I think, from your long experience, you will agree with me that an ounce of prevention is worth a pound of cure—that one perch of fair experiment is worth an acre of theory. The first appearance of the disease in potatoes in this region was in 1843. Some fields on low, moist land were infected a good deal in that season. In 1844 it increased considerably; probably one-fifth of our crops were injured or lost. In 1845 it still increased; I think the loss in our crops may be safely put down at one-third. Knowing, as I did, the progress of the disease, before I planted last spring I availed myself of all the information on the subject within my reach; among the most valuable was contained in a series of articles, from different authors and sources, in Ayelworth's Reports for 1844. Lime and plaster, particularly the former, were reported as the best preventives. I adopted both.

May 10th—plowed 120 square rods sandy loam, in good tilth, but not rich. A crop of corn and one of rye had been raised on it since manuring. Dragged it well, and struck it out into furrows 3½ feet apart: cut my seed (a middling-sized potato) into three parts; wet it; put on as much lime and plaster, in equal parts, as would adhere to the seed; dropped in the furrows 16 inches apart; covered them with rye straw, and turned a furrow each side on to the rows.—When they were 6 inches high, sprinkled plaster on the tops, say a peck on the patch; hoed twice; and harvested on the 10th of October.—Yield, 85 bushels of as fine potatoes as I ever raised or saw—not a rotten one among them. I planted three varieties—the Irish Gray, Mechanic, and Pink-Eye—all were equally good.

May 20th—Planted 35 square rods on one end of my corn-field, where an old fence had been removed; soil similar to the first, but less worn. Prepared the seed by wetting, and rolling in plaster only. Yield, 25 bushels. Found at harvest some few rotten, say half a bushel in all.

July 1st—Broke up one-quarter of an acre of old meadow land on a small run of water; soil somewhat clayey. Planted without any preparation of the seed; hoed once; dug them 1st of November. Yield, 30 bushels—small, and about one-fifth rotten.

This last experiment was in pursuance of a suggestion, in the report referred to, that potatoes not fully ripe were better for seed—being more vigorous to send forth the shoots, &c. I have saved the best of this last crop for seed, and shall plant them the coming season.

Respectfully,
LANSING WETMORE.

Last season was unusually dry. The first-mentioned patch was covered deeper than is usual to cover potatoes. Whether this, or the rye straw, or the lime and plaster, had a tendency to increase the crop, or whether all combined, those who are versed in the chemistry of Agriculture may best determine. L. W.

HOW TO OBTAIN THE BEST POTATOES FOR PLANTING.

At a Farmers' Club in England, Mr. Stephens read a communication from Mr. A. Tod, market gardener, Easter-road, near Edinburgh, on a successful mode, which he had practiced for several years past, of raising Potatoes for seed, and which Mr. Tod considered might also be practiced by farmers who wished to raise good seed Potatoes. After referring to the observation he had frequently made of Potatoes which had grown deep in the soil being mealy and fit for the table, while those which were formed near the surface of the ground were waxy, and consequently unfit for the table, yet made good seed—he alluded to the conviction which this circumstance brought to his mind of the propriety of always raising Potatoes for seed, and those for food in different ways, and he was the more anxious to treat the Potato differently for these different purposes, that he had suffered largely by failures in his early Potatoes. His suggestions for raising seed Potatoes are therefore derived from his own experience, and we believe they will be best understood in his own words. "The remedy I venture to suggest," says Mr. Tod, "is simple and practical, and within the reach of almost every farmer, and of a character that it may be easily tried to a greater or less extent, according to circumstances. I propose that a portion of land most suitable for the rais-

ing of seed Potato should be selected, and, if it require manure, let it be applied and plowed in during the autumn and winter months. In the spring, let the ground be wrought into a fine, friable state, and plant the seed to the depth of two inches, and no more. During the summer, let the ground be kept loose and free of weeds, but do not earth up the plants. In autumn, lift the crop as soon as the stems begin to lose their greenness. By this method the crop will be as large as by the ordinary way; but, what is of more importance, the germinating powers of the Potato will be found greatly improved and invigorated; for the greater number of the tubers having grown above ground will have the advantage of the light and air to form and strengthen in the buds or eyes, and therefore will be much hardier and not so easily injured by rain or frost as those grown in the ordinary way."—In conclusion, Mr. Tod says—"Before I adopted the above method, I had, for several years, failures in my crops of early Potatoes—more especially in the Ash-leaf Kidney and the Adelphi Early—but observing that such tubers as were accidentally growing above ground, exposed to light and air, had well-formed, strong and vigorous eyes or buds, I resolved to adopt the said method of growing my seed, and have done so for the last four years; and the result is that my crops are considerably larger than they were, and have now no blanks." To a question put from the chair, Mr. Tod replied that he cut his seed into sets when the Potatoes were large, but planted the small Potatoes whole. He considered it, however, of the greatest importance to manure the soil in autumn or winter.

POTATOES FROM THE SEED.

A WRITER in a late number of the *Mark-Lane Express* assumes with confidence, that the disease in Potatoes is caused by the sorts in use having "worn out and become tired of the soil;" and recommends *renovation by planting the seed.* For *preserving* the seed, and the procurement of new varieties, he makes the following practical suggestions, which may be of use to the few pains-taking people, who are sometimes jeeringly called *experimenters*, and without whom, it is hard to say how many of our best vegetables and fruits would have been either obtained or preserved.

"Having three times, during a long life, raised Potatoes from seed, and minutely observed the progressof vegetation from the period of sowing to the maturity of the crop, and having given my best attention to the culture in every stage, my practical experience and observations convince me that the time has now arrived which makes it imperative to renovate the *Potato by Seed.* The first step in this experiment, is to collect the balls, or seed berries, or Potato-apples as they are called, and place them in dry a situation; but these would have been found with greater facility before the late crop was raised, yet there are a sufficient number to be found scattered about the land where they grew on every farm. The apples having been hoarded till as mellow as ripe plums, must be squeezed by hand in a basin of water, till the tough skin and pulp are well separated from the seed, the latter of which will readily quit the former, and precipitate to the bottom of the basin; the water must be poured off and the seed spread thinly on a coarse cloth to drain and absorb the remainder of the water; and then removed and spread upon brown paper, and when perfectly dry, must be well preserved till the following spring for sowing. I have found the most favorable time for depositing the seed in the ground, well pulverized, is the second week in May, or thereabouts; at this late period the probable occurrence of frosty nights may be less prevalent than at an earlier sowing, as the tender plants springing up are extremely susceptible of the least frost. The operation of sowing may be performed precisely the same as with onion seed,and there will be no particular care to be farther taken before the time of transplantation. The seed will come up freely, and the plants, when elongated three, four, or five inches, should be carefully raised with as much root as possible adhering, and removed into small trenches ready to receive them, and planted to the depth of the under leaves, distant about six inches apart in the trench, the trenches being about fifteen asunder; and the earthing up may be performed in the usual way as the plants progress; but the transplanting operation will be more favorably done should the earth then possess natural moisture. As the plants advance toward maturity, some will exhibit great luxuriance a long time, and others will sooner appear to droop: the latter indicate an earlier sort, and may be distinguished by placing a little stick at the ham. The process now terminates; but the fruits of the labor in raising the ripe crop will present a scene to the operator truly wonderful and amusing: he will behold among the vast variety of new Potatoes at the roots, from the size of a pea to that of a pullet's egg, purples, whites, flats, rounds, reds, kidneys, &c., &c., in fact, such demonstrations of the sports, freaks, and vagaries of Nature as are truly astonishing. These new roots must be planted whole the following season and after, they will be in perfection for selection as future stock."

CLARIFIED BUTTER.—Melt fresh butter by placing it in a vessel set in a water bath, let it settle, and pour off the clear into an earthenware basin or pot, set in cold water, to cool it as quickly as possible, without letting it crystalize. It keeps a long time without becoming rank. Cooley's Cyclo. of Prac. Receipts.

No. I.....NOTES, AGRICULTURAL AND MISCELLANEOUS.

RAMBLES IN THE SOUTH....*Fiat justitia ruat cœlum.*

LONG-LEAF PINE—TURPENTINE.

If my memory, the frailest of the frail, deceive me not, I wrote you, Mr. Editor of the Farmers' Library, early in February last, in respect of various matters and things whereof I have now no very distinct recollection. My letter was dated at a certain P. V. yclept *Hicksford*, the capital town of Greenville County, Va., where I was "putting-up" with Major Blunt, a plain, but not a "blunt man," being one of easy access and sociable temper, who had, like some others, broken up an old family homestead and moved out to Mississippi, and then—moved back again; either because he had expected too much, or did not find it the place it had been cracked up for, as they say in the West. There at Hicksford aforesaid, my friend Major B. has "opened tavern," and resolutely determined, for the residue of his days, to use his own words, to "take the world as it goes;" good enough philosophy, it must be admitted, provided we exert ourselves faithfully to *make it go right!*

Here it occurs to me, in how many of the walks and occupations of this life, are the various duties of the *Housewife* more important than is usually acknowledged, and, in few instances, is this more truly the case than in the management and labors of these country or village Inns. While the name of the landlord heads the bill, and swings forever in conspicuous letters on the sign, who is it that drudges in the back-ground, and keeps the chambers in order, and sees the table spread with refreshments for the way-worn traveler? Let him then, while discharging the reckoning with "base lucre" to the landlord, offer the poor tribute of his thanks to her whose housewifely cares have refreshed the inward man, and sent him recruited on his journey.—In the spirit of my motto, that in which I shall speak of all I see, "*Let Justice be done, tho' the Heavens fall!*"

Devoid as old country villages may be supposed to be, of intellectual resources and cultivation, those who seek them in a proper way, may, at most of them, find their own equals, at least in general intelligence, ready to communicate what the inquiring traveler may desire to learn, either of the natural resources or industrial products of the surrounding country. But, alas! how long, to the shame of Agriculture and all other pursuits, shall it remain, that for men of a higher order of intelligence, and familiarity with all that is most worthy to be known, you must everywhere go, in our country, to the *Doctor and the Lawyer?*—not only for information in respect of the constitution and laws of a particular State, and the peculiar diseases of the particular locality; but for its Geology, its Natural History, Climate, Productions, and local capabilities for Manufactures, Commerce, and all the various branches of Industry! Why should not every young farmer be, by our systems of education, and in conformity with an improved public sentiment, as variously and thoroughly instructed on general subjects, both scientific and literary? Do not his daily walks and pursuits lead him, above all others, to observe and invite him to study the science which treats, not alone of the elements of the farm he cultivates, but of the earth in general, and the various relations which the different masses of which it is composed, bear to each other—as well as to study all those parts of Natural History which relate to the plants that are growing, the animals that are feeding, and the birds that are flying around him?—Is it not before him, and for him especially, that Nature spreads out her ample volume, in which every page has its interest? Is it not emphatically in the view of the agriculturist, that

> "Link after link the vital chain extends,
> And the long line of being never ends?"

Until public legislation shall have established systems of education that shall open the way to, and ensure a knowledge of, the sciences connected with the practical exercise of the agricultural art, why indulge in vain and preposterous boasting about the freedom of our Political Institutions, and the universal and direct agency of the People in the entire action of the Government? To possess and not to use such freedom for that interest of Society which so much transcends all others, is to abuse it; yet what have the People, the landholders of the country, done toward ensuring Governmental provision for instruction in *Agriculture*, or in smoothing the way of *its* products to market; while they have been paying hundreds of millions for military instructions, military maps, and military roads and surveys and ships? What is the Press of the country doing to the formation of a correct and redeeming public sentiment on this subject? Is it not of legal enactment that if you would have your son get a *life* commission, to glory in

conscious exemption from the vicissitudes of party, and the caprices of power, you must make interest to get him in the *military!* and is it not the common public impression, that if you would have him acquire intellectual renown—be the ornament and the focus of attraction in the public councils, or the social circle—in a word, a man of consideration and influence in the world, he must eschew all thought of being a tiller of the soil, on whose products all professions live, as the mistletoe on the oak, and betake himself to the office of *the Doctor or the Lawyer, or to the Army, or the Navy!*

But this is a digression suggested by the residence at that ford of the Meherrin called Hicks'. as aforesaid, of Doctors M..... and B..... possessing, either of them, talents and information enough to relieve a larger place from the discredit of being wanting in intellectual refinement.

Lands through that region of country traversed by the great Southern line of railroad, may be had—many farms, with dwellings as good as those of the opulent Creole Planters on the Mississippi, for from $2 to $5 an acre on long time. Cotton is still cultivated there, but not with results to remunerate the labor and capital employed in it. There, as well as at Petersburg and Richmond, there is a vast amount of natural water-power unoccupied, but that resource, like some others, has been exploded or impaired by the application of steam-power to manufactures in large towns, to and from which the raw material and the manufactured articles are borne on the wings of Commerce, and where capitalists choose to employ their means under their own more immediate supervision.

Were it not that I would avoid another digression. although my roving commission carries with it no obligation to sail any given course, it would not be difficult to show that all that part of Virginia at all distant from navigation, and of which *Grain* or even Cotton is the staple, must be. sooner or later, and is now fast being, abandoned. It will not pay expenses and repair wear and tear. The ship so manned must ultimately go down; and those who soonest discover that there is a leak in the bottom which may be patched and caulked for a time, but can never be permanently stopped, will save the most from the wreck which is inevitable. Your readers in the North will hardly believe that there are many hundred thousand acres of land in Virginia, that may be purchased for from 20 cents to $2 an acre; and, in the high regions of Georgia, may be entered 160 acres for $15.

A circumstance which seems to indicate that *want of thought* (not knowing what else to call it), which is too characteristic of agriculturists, is the practice of advertising their lands, when they wish to sell, so *exclusively in the local neighborhood papers*—thus circulating their notices among those so many of whom are in the same condition with themselves. Common sense would seem to suggest that notices of commodities for sale should be distributed where there is the greatest probability of demand, and means of purchase; and not where all are alike sellers and none buyers—or only a few, who lie by, with their money-bags, ready to pounce on the victim of imprudence or misfortune, as the spider on the luckless fly that falls into his web.—The practiced, keen-sighted merchant, in this as in other things, shows more sagacity. He sends his advertisement to the region, however distant, where it is most *likely to tell.*

From Hicksford you proceed by railroad in one night to Raleigh, if curiosity or business should lead you to the capital town of the Old North State. There is to be seen, probably, the handsomest Capitol of any State in the Union; but what enterprise of that sort does Southern enterprise carry out? The grounds around this beautiful building, so susceptible of easy and elegant embellishment, remain as open commons, where any beast may pasture and repose in the shade of its native oaks. The building cost, it seems, so much beyond the estimate, as is usual in such cases, that both parties are afraid *to risk their popularity* on voting the sum of a few thousand dollars to enclose and improve it.

Raleigh is distinguished as the residence of Mr. Badger, an eminent lawyer, whose income for twenty years has been from 6 to $10,000 annually. He was Secretary of the Navy under Mr. Tyler, and resigned on finding, as he stated, that that gentleman had determined to repudiate what he had authorized his Cabinet to promise, in his behalf, on certain measures of importance.

I was struck, on the Gaston and Raleigh Railroad, with the singular process adopted for *watering the passengers!* Occasionally, through the night, Cuffee enters at one door of the car, and passes on slowly to the other, with a large stone pitcher in his left hand. *En passant*—a drowsy passenger, between waking and sleeping, grasps at the handle of the pitcher, supposing he is to take his drink by word of mouth; but Cuffee holds fast, and, without even casting his eyes in the direction of what is going on, only and briefly remarks, "*Gourd in dar.*" This is all he can be provoked to say. At last the passenger begins to apprehend him, and, thrusting his hand into the pitcher, pulls up a gourd full of water, of which he partakes what his thirst demands, and, having no place for the residue, lets fall the whole again into the pitcher—when Blacky (Cæsar, or Wellington, or some such great character) proceeds, and as another passenger awakes, and reaches to take the pitcher, he again is told, "*Gourd in dar,*"—and thus the passengers are watered about as often

through the night as the engine itself. Those who are not for Raleigh pass on from Gaston directly to Wilmington.

At various points on the road, I heard anecdotes and facts illustrative of the loyalty of the blacks, and of the total absence of any general feeling of wrong or churlish discontent at their condition. On occasion of the Court House at Raleigh taking fire some time since, and endangering the public records, the blacks labored with voluntary and indomitable energy and devotion, and with a spirit of perseverance so desperate that the whites were obliged, at last, to stone them out of the upper story, lest they should perish by the falling in of the roof.—When, at last, they were forced to retreat, one of them, with evident chagrin, observed to his master—"Lord, sir! if the white folks had n't druv us out, we could ha' saved *the vally o' three niggers!*" The truth is that the slaves of the South plume themselves very much, each on his own supposed value to his master. On one occasion, a gentleman was going to the west, but was embarrassed to know what he should do with a valuable and favorite servant, whose wife belonged to a neighbor. It occurred to him to propose to exchange his man, with the neighboring owner of the man's wife, for one of his men who was unmarried, and perfectly willing to go, but made strong objection and presented much difficulty on the ground that *his* master would lose by the bargain, as he considered himself worth at least $100 more than the man who was to be taken in exchange for him; and was, at last, only reconciled when he was given to understand that the boot he named would be given in the *swap!* In this matter of exchange and sale of favorite servants, great sacrifice of feeling and of property is frequently and reciprocally made, and arrangements for removal to other States, promising the most advantageous results to slave owners, are not unfrequently abandoned because of the difficulty of effecting these exchanges or purchases in a way to enable them to go without involving painful separation of favorite family servants.—And yet it is wonderful to those who are not aware of the short-lived nature of all their emotions, how soon absence assuages the pang of separation with these people, especially on the part of those who are removed and "gwine away to the wild-goose country," as their song goes. The voluntary and permanent rupture of the nearest ties of blood and kindred, on the part of white emigrants that throng every mode of conveyance from the east and north to the south and north-west, are far more numerous than the forced removal of kindred blacks to climates much more congenial to their constitution.

Inquiring of a negro woman at Raleigh if she supposed the Governor was then in the State-House, she answered, "No, sir, he is at the *Palace*," in a way so familiar as to show that Palace is there the common designation for the Governor's House.

From Raleigh the next day, in one of Col. Guion's excellent lines of stages, I struck the railroad again at place called Goldsboro', and there took the cars for Wilmington, where you arrive early in the day. Barren as is the road from Raleigh to the Point above mentioned, even that line of observation is not without interest to a man whose disposition leads him to find knowledge or amusement as well in a by-path, as on the highway—as well in a hut, as in a palace. Here I was amused and had many a youthful reminiscence revived, by observation of the primitive simplicity and mode of living kept up since the first settlement of the country. In the simple habitations we entered to get warm, or to get a gourd of water, or it may be to indulge not ill-intended curiosity, we saw young women dressed in "home made," still plying the shuttle at the rate of about six yards a day, in a loom at least a hundred years old. Not one inch of advance in the art of weaving has been made for a century, and probably another will pass before even the flying or spring shuttle will reach them. In the corner of an old fashioned fire place, big enough to roast an ox, sat the old lady, either knitting or making up cloth of her own spinning, which they say "wears so much better than *store-cloth*." Over the mantle in its amplitude, and at a goodly hight, hang the turkey's wing, the almanac, some bunches of red pepper, and small bags of seed, with divers other things, which, (or things of the same kind) have hung on the same nails time out of mind. As the light flagged, the old lady would throw on a billet of fat "light wood," which lay conveniently at her feet, and on surprise being expressed that she could work altogether by fire-light, she remarked with honest simplicity, "Well, If you haint got no light wood whar you live, how *do* you see to work?" Nothing truly can excel the attractive cheerfulness of these bright blazing light wood fires as you pass on a cold night along the pine forest roads of Carolina. At Smithfield we got a dinner that for comeliness and cookery, far excelled the fare of the great hotel at the Capital. Here to my agreeable surprise, I met with an old and intelligent Turf-Register acquaintance and correspondent of yours, Mr. Editor, in the person of Col. John M. L ...,who has much experience in the cultivation, if it may be called, of *tar and turpentine*, the great staples of this part of the country. From him, as from others after him, I learned that I was now passing in fact, through the very heart of the tar and turpentine region; and with no little astonishment on my part, at the profitableness of the labor employed

in collecting and making them, and with yet more surprise at the seemingly endless value of that quality of pine, all of which is so little known out of the immediate neighborhood in which they are produced. From brief notes made in passing, and farther information promised, I may furnish you, for an early number, with a full amount of the whole process and the results.

The reflections induced, in connection with the growth of this species of pine, are strange and important in a view of the distant future: as for instance: The wings of marine commerce of the whole world, it will be admitted, would be clipped, if not entirely destroyed, but for the use of the product of this beautiful evergreen; and yet, from some mysterious operations of Nature, or the spread and influence of civilization, of which commerce is the great promoter, it would seem from present appearances, according to all I heard, that a stop has been put to the successions of its growth which has been going on for centuries. The time is thus approaching, according to the opinion of judicious observers on the spot, when scarcely a vestige will remain of this valuable and majestic tree, where now it is so flourishing and abundant. Let me be understood. In the boyhood of men fifty years ago, it was a part of children's play to bend down the young pine growth in the woods, to ride upon. They were of that size, as common then, as the larger growth is now, and only of two, three or four years' growth, and about the size of a walking-cane stripped of the bark, and about five, six, or seven feet high. That same generation is now as large as an Alderman's leg: but here is the wonder! *There is none of that age or kind in preparation by Nature, as successors to the present stock in Carolina.* It is rarely that one is to be found; and yet the seed, (or mast as it is called,) is as abundant as ever, and vegetates as thickly as it ever did; but it soon disappears. After it is the size of wheat in November, little more of it is ever seen. The impression of those who have most closely noticed these facts personally is, that the *present generation of pine will be the last that will be seen in North Carolina, perhaps forever.*

In the hope of being enabled soon to give a full account of this extraordinary breach of industry, which opened upon me in the midst of a dense, dreary forest, suffice it now to say, that in the language of the country, one hand is capable of attending to a "*crop*" of so many "*boxes;*" and many of them collect from 150 to 200 barrels of turpentine, worth, last autumn, upward of $3 a barrel. It was said that one man, with his three hands, allowing them a small portion of the proceeds, had realized upward of $4,000. The turpentine is either shipped from Wilmington, where vessels are lying to take it to northern ports, or is distilled into spirits of Turpentine, on the spot; and this has been found so profitable that there are already 40 distilleries in operation in Wilmington and along the river. I need not tell you that these are the fruits of Yankee penetration—for you remember where Bonaparte said their enterprise would carry them for a bag of coffee. The wonder strikes the most superficial into the industrial pursuits of the country under his view, how it is that a branch of business so exceedingly profitable should not be entered upon by those who inhabit a line of 400 miles of continuous long-leaf pine growth from Savannah, Georgia, to Chehaw in Alabama! I may trouble your readers on some early occasion with some reflections on this problem, as well as with some of the statistics, agricultural and commercial, of the tar and turpentine industry of North Carolina.

Well! how shall I *sum up* the observations that a traveler is likely to make, on the great thoroughfare of —— miles between Washington and Wilmington? Every one knows, or ought to know, that from the necessity of the case, the main lines of travel through a new country must traverse the ridges or back bones of particular sections, avoiding impassable water courses and the rich alluvial lands that border them. Thus we are not surprised at sparse settlements and slender products. But what most interests the philosophical observer is, the *spirit and character of the people*, as indicated by the appearance of the *settled* parts of the country? How look the dwellings—not whether large or small, but has any taste been displayed in their Architecture? Have any native shade-trees been left standing, or have any been planted and *kept in order?* Has provision been made for a succession of good vegetables in a well enclosed garden? Is there a piazza before the mansion, however rude and humble, and has the housewife been encouraged and provided with means to train over it the vine, and the yellow jasmine, and the multiflora, and the honeysuckle? And then the field cultivation—no matter how small the scale of it, but is the tillage perfect? Does the plow run close to the road and the fence sides? Have the harrow and the roller, and, yet more, the *drag-log*, done their office in the way of pulverization? But first, and above all, have his fields—no matter, again, how small—but have they, as far as in cultivation, been *well and thoroughly drained* of all superficial and surplus moisture, every drop? *for not a drop should stagnate in or upon it.* In a word, does the farm or plantation under view, proclaim to the passing observer, that the owner's mind is itself a *cultivated field?*—one which by education and reading has been imbued with a salutary thirst for knowledge; one which a laudable

pride has inspired with ambition to have it said that he excels in what he *does* undertake? In a word, is there an air of neatness and cleanliness about his homestead, and exact and perfect culture in his field to show that thought has drained his own mind of sloth and ignorance, and reading and reflection on the why and the wherefore of everything that is done, let in upon his soul the light of agricultural discovery and the genial warmth of virtuous and useful knowledge, in which, after all, is the only true glory to be found? *or*, does the absence of all these features in the aspect of the country, betray, along the line in question, the presence of a population too much given up to indolence of mind and body, and the party purposes of party hacks—consuming time, the most precious of all things, in the vain retrospect o better times, or the debasing pursuit of petty offices, without education, or the moral courage which proper education only can give, to look existing difficulties in the face, and at once set about the work of reform, or abandon at once, fields of profitless labor, that no degrees of knowledge and industry can reclaim and fructify? Trying the country which falls under the eye of the stranger on his way from Aquia Creek to Wilmington, N. C. by these tests, and the painful conviction strikes you that there is *some spell* resting upon it. Try it by the census as the measure of national progress, and that conclusion is but too well confirmed. On one farm there were signs of an enterprising owner: the fences were in order and a great quantity of barn-yard manure had been made and hauled out for the ensuing crop; and some miles, again, before you get to Richmond, on the larboard hand, there is a farm in nice order: the plowing had been early and well done; the soil was well pulverized and the water-furrows were skillfully and well opened to drain the land. Some passenger said it belonged to a Mr. LYON, and I could not help wishing that *such* Lions could be found standing in the path of young agriculturists, here and there, throughout the country. Approaching Petersburg, again, on the same side of the railroad, you find an oasis in the desert, in the handsome residence of a Mr. DUNLOP, a Scotch gentleman "of that ilk." A plantation of beautiful shade-trees ornament an expansive lawn around his mansion, and a handsome graveled pathway conducts to a neat spring-house, which you may easily fancy is well stored with rich milk and nice butter for breakfast, to be enjoyed in the shade of his ample piazzas at this season. I would hazard any thing at a venture that both these gentlemen are readers of Bott's *Southern Planter*.

VIATOR.

P. S.—Observe, I have not been speaking of farms off the road—such as Mr. Wellford's, near Fredericksburg, or the great corn plantations of the Taylors, or the Tayloes, on the Rappahannock, or the wheat farms such as Hill Carter's and Bowling's, on the James River, where intellect of a high order combines humanity with strict discipline, and gives to labor and capital their most skillful direction. Of these I have seen a little and heard the most honorable reports, and hope to be able to speak more at large, some day, on personal observation.

CASK MAKING BY MACHINERY.

Considerable sums of money have at various times been expended in trying to bring to perfection machinery for making casks, but heretofore this object has been unattained, some parts always having to be finished by manual labor. A very ingeniously constructed machine (which we have had an opportunity of inspecting) has at last, however, been constructed by Mr. W. Wild, of Bedford-street, Broughton-road. The lags or staves, hoops, and heads, are, in the first instance, dressed off by other machinery, which is being constructed for the purpose; afterward the finishing machine is fed with the previously prepared heads, hoops, and staves, and will in two minutes' time turn out a complete barrel, vastly superior in workmanship to what has hitherto been effected by manual labor. Old barrels can also as easily be repaired by the same machine, the only difference in time being occupied in the taking to pieces of the old barrels previously to substituting such fresh staves, heads, or hoops, as may be required previously to feeding the machine. The barrels, when completed, are vastly superior to any heretofore turned out by manual labor, the machine fitting each stave as close as though the whole barrel had been formed of one piece of timber—thus doing away with the necessity, when made by hand, of filling up any defects with rushes; which plan, it is well known, has the effect of rendering casks very foul, unless extraordinary care be taken, and consequently much time is occupied in thoroughly cleansing them.

[Manchester (Eng.) Courier.

Would not this inventor find a great field for his machine in the rice region of the U. States, where so many casks are needed—where timber is so cheap, and labor so dear? A rice cask holds about 9 or 10 bushels; and the "*task*" for a man, with the staves and hoops at hand, is to set up three in a day. [*Ed. Farm. Lib.*

TO EXTERMINATE BEETLES.—Place a few lumps of unslaked lime where they frequent; or set a dish or trap, containing a little beer or syrup, at the bottom, and place a few sticks slanting against its sides, so as to form a sort of gangway for the beetles to climb up by, when they will go headlong into the bait set for them. Another plan: mix equal weights of red lead, sugar, and flour, and place it nightly near their haunts This last mixture made into sheets, forms the beetle-wafers, sold at the oil shops

[Cooley's Cyclo. of Practical Receipts.

LINES AMONG THE LEAVES.

BY ELIZA COOK.

HAVE ye heard the west wind singing, where the summer trees are springing?
Have ye counted o'er the many tunes it knows?
For the wide-winged spirit rangeth, and its ballad metre changeth
As it goes.

A plaintive wail it maketh when the willow's tress it shaketh,
Like new-born infant sighing in its sleep;
And the branches, low and slender, bend to list the strain so tender,
Till they weep.

Another tale 't is telling, where the clustered elm is swelling
With dancing joy, that seems to laugh outright;
And the leaves, all bright and clapping, sound like human fingers snapping
With delight.

The fitful key-note shifteth where the heavy oak uplifteth
A diadem of acorns broad and high;
And it chants with muffled roaring, like an eagle's wings in soaring
To the sky.

Now the breeze is freshly wending, where the gloomy yew is bending,
To shade green graves and canopy the owl;
And it gives a mournful whistle, that remindeth of the missal
And the cowl.

Another lay it giveth where the spiral poplar liveth,
Above the cresses, lily, flag, and rush;
And it sings with hissing treble like the foam upon the pebble
In its gush.

A varied theme it utters where the glossy date-leaf flutters—
A loud and lightsome chant it yieldeth there;
And the quiet, listening dreamer may believe that many a streamer
Flaps the air.

It is sad and dreary hearing where the giant pine is rearing
A lonely head, like hearse plume waved about;
And it lurketh melancholy where the thick and sombre holly
Bristles out.

It murmurs soft and mellow mid the light laburnums yellow,
As lover's ditty chimed by rippling plash,
And deeper is its tiding, as it hurries, swiftly gliding
Through the ash.

A roundelay of pleasure does it keep in merry measure,
While rustling in the rich leaves of the beech,
As though a band of fairies were engaged in Mab's vagaries,
Out of reach

Oh! a bard of many breathings is the Wind in sylvan wreathings,
O'er mountain tops and through the woodland groves,
Now fifing and now drumming—now howling and now humming,
As it roves.

Oh! are not human bosoms like these things of leaves and blossoms,
Where hallowed whispers come to cheer and rouse?
Is there no mystic stirring in our hearts, like sweet wind whirring
In the boughs?

Though that wind a strange tone waketh in every home it maketh,
And the maple tree responds not as the larch,
Yet Harmony is playing round all the green arms swaying
'Neath Heaven's arch.

Oh! what can be the teaching of these forest voices preaching?
'T is that a brother's creed, though not as mine,
May blend about God's altar, and help to fill the psalter
That 's divine.

AN INTERESTING CHAPTER FOR FARMERS.

[From Dr. Lardner's Lectures.*]

SUPPOSED EFFECT OF THE MOON ON TERRESTRIAL OBJECTS.

The Red Moon—Supposed effect of the Moon on the Movement of Sap in Plants—Prejudice respecting the time for felling Timber—Extent of this Prejudice—Its Prevalence among Transatlantic People—Prejudices respecting Effects on Grain—On Wine—On the Complexion—On Putrefaction—On Wounds—On the Size of Oysters and Shell-fish—On the Marrow of Animals—On the Weight of the Human Body—On the Time of Births—On the Hatching of Eggs—On Human Maladies—On Insanity—On Fevers—On Epidemics—Case of Vallisnieri—Case of Bacon—On Cutaneous Diseases, Convulsions, Paralysis, Epilepsy, &c.—Observations of Dr. Olbers.

On a former occasion I examined the question respecting the supposed influence of the moon upon the weather, and demonstrated that so far as actual observation has hitherto afforded grounds for reasoning, there is no discoverable correspondence between the lunar changes and the vicissitudes of rain and drouth which can justify or in any degree countenance the popular belief so generally entertained as to dependence of change of weather upon the changes of the moon.

But meteorological phenomena are not the only effects imputed to our satellite; that body, like comets, is made responsible for a vast variety of interferences with organized nature. The circulation of the juices of vegetables, the qualities of grain, the fate of the vintage, are all laid to its account; and timber must be felled, the harvest cut down and gathered in, and the juice of the grape expressed, at times and under circumstances regulated by the aspects of the moon, if excellence be hoped for in these products of the soil.

According to popular belief, our satellite also presides over human maladies; and the phenomena of the sick chamber are governed by the lunar phases; nay, the very marrow of our bones, and the weight of our bodies, suffer increase or diminution by its influence Nor is its imputed power confined to physical or organic effects; it notoriously governs mental derangement.

If these opinions respecting lunar influence were limited to particular countries, they would be less entitled to serious consideration; but it is a curious fact that many of them prevail and have prevailed in quarters of the earth so distant and unconnected that it is difficult to imagine the same error to have proceeded from the same source. At all events, the extent of their prevalence alone renders them a fit subject for serious investigation; and I propose at present to lay before you some of the principal facts and arguments bearing on these points, for the collection of which we are mainly indebted to the industry and research of M. Arago.

A large volume would be necessary to analyze all the popular opinions which refer to the supposed lunar influences. We shall confine ourselves, therefore, to the principal of them, and shortly examine how far they can be reconciled with the established principles of Astronomy and Physics.

The Red Moon.—It is believed, generally, especially in the neighborhood of Paris, that in certain months of the year, the moon exerts a great influence upon the phenomena of vegetation. Gardeners give the name of *Red Moon* to that moon which is full between the middle of April and the close of May. According to them, the light of the moon at that season exercises an injurious influence upon the young shoots of plants. They say that when the sky is clear the leaves and buds exposed to the lunar light redden and are killed as if by frost, at a time when the thermometer exposed to the atmosphere stands at many degrees above the freezing point. They say also that if a clouded sky intercepts the moon's light it prevents these injurious consequences to the plants, although the circumstances of temperature are the same in both cases.

Any person who is acquainted with the beautiful theory of dew, which we owe to Dr. Wells, will find no difficulty in accounting for these effects erroneously imputed to the moon. If the heavens be clear and unclouded, all substances on the surface of the earth which are strong and powerful radiators of heat, lose temperature by radiation, while the unclouded sky returns no heat to them to restore what they have lost. Such bodies, therefore, under these circumstances, become colder than the surrounding air, and may even, if they be liquid, be frozen. Ice, in fact, is produced, in warm climates, by similar means. But if the firmament be enveloped in clouds, the clouds have the quality of radiating heat, will restore by their radiation, to substances upon the surface of the earth, as much heat as such substances lose by radiation; the temperature, therefore, of such bodies will be maintained at a point equal to that of the air surrounding them.

Now the leaves and flowers of plants are strong and powerful radiators of heat; when the sky is clear they therefore lose temperature and may be frozen; if, on the other hand, the sky be

* Popular Lectures on Science and Art, delivered in the principal Cities and Towns of the United States, by Dionysius Lardner, Doctor of Civil Law, Fellow of the Royal Society of London and Edinburgh, formerly Professor of Astronomy and Natural Philosophy in the University of London. 2 vols. octavo, with numerous Engravings. New-York: Greeley & McElrath.

clouded, their temperature is maintained for the reasons above stated.

The moon, therefore, has no connection whatever with this effect; and it is certain that plants would suffer under the same circumstances, whether the moon is above or below the horizon. It equally is quite true that if the moon be above the horizon, the plants cannot suffer unless it be visible; because a *clear sky* is indispensable as much to the production of the injury to the plants as to the visibility of the moon; and, on the other hand, the same clouds which veil the moon and intercept her light give back to the plants that warmth which prevents the injury here adverted to. The popular opinion is therefore right as to the *effect*, but wrong as to the *cause*; and its error will be at once discovered by showing that on a clear night, when the moon is new, and, therefore, not visible, the plants may nevertheless suffer.

Time for felling Timber.—There is an opinion generally entertained that timber should be felled only during the decline of the moon: for if it be cut down during its increase, it will not be of a good or durable quality. This impression prevails in various countries. It is acted upon in England, and is made the ground of legislation in France. The forest laws of the latter country interdict the cutting of timber during the increase of the moon. M. Auguste de Saint Hilaire states that he found the same opinion prevalent in Brazil. Signor Francisco Pinto, an eminent agriculturist in the province of Espirito Santo, assured him as the result of his experience, that the wood which was not felled at the full of the moon was immediately attacked by worms and very soon rotted.

In the extensive forests of Germany, the same opinion is entertained and acted upon with the most undoubting confidence in its truth. Sauer, a superintendent of some of these districts, assigns what he believes to be its physical cause. According to him the increase of the moon causes the sap to ascend in the timber; and, on the other hand, the decrease of the moon causes its descent. If the timber, therefore, be cut during the decrease of the moon it will be cut in a dry state, the sap having retired; and the wood, therefore, will be compact, solid and durable. But if it be cut during the increase of the moon, it will be felled with the sap in it, and will therefore be more spongy, more easily attacked by worms, more difficult to season, and more readily split and warped by changes of temperature.

Admitting for a moment the reality of this supposition concerning the motion of the sap, it would follow that the proper time for felling the timber would be the new moon, that being the epoch at which the descent of the sap would have been made, and the ascent not yet commenced. But can there be imagined in the whole range of natural science, a physical relation more extraordinary and unaccountable than this supposed correspondence between the movement of the sap and the phases of the moon? Assuredly theory affords not the slightest countenance to such a supposition: but let us inquire as to the fact whether it be really the case that the quality of the timber depends upon the state of the moon at the time it is felled.

M. Duhamel Monceau, a celebrated French agriculturist, has made direct and positive experiments for the purpose of testing this question; and has clearly and conclusively shown that the qualities of timber felled in different parts of the lunar month are the same. M. Duhamel felled a great many trees of the same age, growing from the same soil, and exposed to the same aspect, and never found any difference in the quality of the timber when he compared those which were felled in the decline of the moon with those which were felled during its increase; in general they have afforded timber of the same quality. He adds, however, that by a circumstance which was doubtless fortuitous, a slight difference was manifested in favor of timber which had been felled between the new and full moon—contrary to popular opinion.

Supposed Lunar Influence on Vegetables.—It is an aphorism received by all gardeners and agriculturists in Europe, that vegetables, plants and trees, which are expected to flourish and grow with vigor, should be planted, grafted, and pruned, during the increase of the moon. This opinion is altogether erroneous. The increase or decrease of the moon has no appreciable influence on the phenomena of vegetation; and the experiments and observations of several French agriculturists, and especially of M. Duhamel du Monceau (already alluded to) have clearly established this.

Montanari has attempted, like M. Sauer, to assign the physical cause for this imaginary effect. During the day, he says, the solar heat augments the quantity of sap which circulates in plants by increasing the magnitude of the tube through which the sap moves; while the cold of the night produces the opposite effect by contracting these tubes. Now, at the moment of sunset, if the moon be increasing, it will be above the horizon, and the warmth of its light would prolong the circulation of the sap; but, during its decline, it will not rise for a considerable time after sunset, and the plants will be suddenly exposed to the unmitigated cold of the night, by which a sudden contraction of leaves and tubes will be produced, and the circulation of the sap as suddenly obstructed.

If we admit the lunar rays to possess any sensible calorific power, this reasoning might be allowed; but it will have very little force when it is considered that the extreme change of temperature which can be produced by the lunar light, does not amount to the thousandth part of a degree of the thermometer.

It is a curious circumstance that this erroneous prejudice prevails on the American continent. M. Auguste de Saint Hilaire states that, in Brazil, cultivators plant during the decline of the moon all vegetables whose roots are used as food; and, on the contrary, they plant during the increasing moon the sugar-cane, maize, rice, beans, &c. and those which bear the food upon their stocks and branches. Experiments, however, were made and reported by M. de Chauvalon, at Martinique, on vegetables of both kinds planted at different times in the lunar month, and no appreciable difference in their qualities was discovered.

There are some traces of a principle in the rule adopted by the South American agronomes, according to which they treat the two classes of plants, distinguished by the production of fruit on their roots or on their branches, differently; but there are none in the European aphorisms. The directions of Pliny are still more specific: he prescribes the time of the full moon for sowing beans, and that of the new moon for lentils. "Truly," says M. Arago, "we have need of a robust faith to admit, without proof, that the moon, at the distance of 240,000 miles, shall in

one position act advantageously upon the vegetation of beans, and that in the opposite position, and at the same distance, she shall be propitious to lentils."

Supposed Lunar Influence on Grain.—Pliny states that, if we would collect grain for the purpose of immediate sale, we should do so at the full of the moon; because, during the moon's increase, the grain augments remarkably in magnitude; but if we would collect the grain to preserve it, we should choose the new moon, or the decline of the moon.

So far as it is consistent with observation that more rain falls during the increase of the moon than during its decline, there may be some reason for this maxim; but Pliny, or those from whom we receive the maxim, can barely have credit for grounds so rational; besides which, the difference in the quantity of rain which falls during the two periods is too insignificant to produce the effects here adverted to.

Supposed Lunar Influence on Wine-making. It is a maxim of wine-growers that wine which has been made in two moons is never of a good quality, and cannot be clear. Toaldo, the celebrated Italian meteorologist, whose mind appears to have been predisposed for the reception of lunar prejudice, attempts to justify this maxim. "The vinous fermentation," he says, "can only be carried on in two moons when it begins immediately before the new moon; and, consequently, that this being a time when the enlightened side of the moon is turned for the most part from the earth, our atmosphere is deprived of the heat of the lunar rays; that, therefore, the temperature of the air is lowered, and the fermentation is less active.

To this we need only answer that the moon's rays do not affect the temperature of the air to the extent of one-thousandth part of a degree of the thermometer, and that the difference of temperatures of any two neighboring places in which the process of making the wine of the same soil and vintage might be conducted must be a thousand times greater at any given moment of time; and yet no one ever imagines that such a circumstance can affect the quality of the wine.

It is a maxim of Italian wine merchants that wine ought never to be transferred from one vessel to another in the months of January or March, unless in the decline of the moon, under penalty of seeing it spoiled.

Toaldo has not favored us with any physical reason for this maxim; but it is remarkable that Pliny, on the authority of Hyginus, recommends precisely the opposite course. We may presume that, from such contrary rules, it may reasonably be inferred that the moon has no influence whatever in this case.

Among the maxims of Pliny we find that grapes should be dried by night at new moon, and by day at full moon.

When the moon is new it is below the horizon during the night, and above it during the day; and when it is full it is above the horizon during the night, and below it during the day. The maxim of Pliny, therefore, is equivalent to a condition requiring that the grapes should be dried when the moon is below the horizon. It is evident that the absence of the moon is not required in this case in consequence of any effect which her light might produce if she were present; for when the moon is new she affords no light, even when in the firmament—the illuminated side being turned from the earth. If the maxim be founded upon any reason, it must, therefore, either be on some influence which the moon is supposed to produce when present, independent of her light (the absence of which influence is desired); or it may be that she may be supposed to transmit some effect through the solid mass of the earth, when on the other side of it, which she is incapable of producing without its intervention. The maxim is probably as absurd and groundless as the other effects imputed to the moon.

Supposed Lunar Influence on the Complexion.—It is a prevalent popular notion, in some parts of Europe, that the moon's light is attended with the effect of darkening the complexion.

That light has an effect upon the color of material substances is a fact well known in physics and in the arts. The process of bleaching by exposure to the sun is an obvious example of this class of facts. Vegetables and flowers which grow in a situation excluded from the light of the sun are different in color from those which have been exposed to its influence. The most striking instance, however, of the effect of certain rays of solar light in blackening a light-colored substance, is afforded by chloride of silver, which is a white substance, but which immediately becomes black when acted upon by the rays near the red extremity of the spectrum. This substance, however, highly susceptible as it is of having its color affected by light, is, nevertheless, found not to be changed in any sensible degree when exposed to the light of the moon, even when that light is condensed by the most powerful burning lenses. It would seem, therefore, that, as far as any analogy can be derived from the qualities of this substance, the popular impression of the influence of the moon's rays in blackening the skin receives no support.

M. Arago (who generally inclines to favor rather than oppose prevailing popular opinions) appears to think it possible that some effect may be produced upon the skin exposed on clear nights, explicable on the same principle as that by which we have explained the effects erroneously imputed to what is called the *red moon.*—The skin being, in common with the leaves and flowers of vegetables, a good radiator of heat, will, when exposed on a clear night, for the same reasons, sustain a loss of temperature.—Although this will be to a certain extent restored by the sources of animal heat, still it may be contended that the cooling produced by radiation is not altogether without effect. It is well known that a person who sleeps exposed in the open air, on a night when the dew falls, is liable to suffer from severe cold, although the atmosphere around him never falls below a moderate temperature, and although no actual deposition of dew may take place upon his skin. This effect must arise from the constant lowering of temperature of the skin by radiation. In military campaigns the effects of bivouacing at night appear to be generally admitted to darken the complexion.*

There is a proverb which is used in certain parts of France as a warning against night promenades:

> "Que lou sol y la sereine
> Fau gerie la gent Mouraine."

* Le hâle de bivouac is an effect quite recognized. Hâle is a term which expresses a state of the air which makes an impression upon the complexion, rendering it tanned and burnt.

It is remarkable that this proverb is current in places where the red moon is not noticed.

Supposed Lunar Influence on Putrefaction.—Pliny and Plutarch have transmitted it as a maxim, that the light of the moon facilitates the putrefaction of animal substances, and covers them with moisture. The same opinion prevails in the West Indies, and in South America. An impression is prevalent, also, that certain kinds of fruit exposed to moonlight lose their flavor and become soft and flabby; and that if a wounded mule be exposed to the light of the moon during the night, the wound will become irritated, and frequently become incurable.

Such effects, if real, may be explained upon the same principles as those by which we have already explained the effects imputed to the red moon. Animal substances exposed to a clear sky at night, are liable to receive a deposition of dew, which humidity has a tendency to accelerate putrefaction. But this effect will be produced if the sky be clear, whether the moon be above the horizon or not. The moon, therefore, in this case, is a witness and not an agent; and we must acquit her of the misdeeds imputed to her.

Supposed Lunar Influence on Shell-fish.—It is a very ancient remark, that oysters and other shell-fish become larger during the increase than during the decline of the moon. This maxim is mentioned by the poet Lucilius, by Aulus Gellius and others; and the members of the Academy *del Cimento* appear to have tacitly admitted it, since they endeavor to give an explanation of it. The fact, however, has been carefully examined by Rohault, who has compared shell-fish taken at all periods of the lunar month, and found that they exhibit no difference of quality.

Supposed Lunar Influence on the Marrow of Animals.—An opinion is prevalent among butchers that the marrow found in the bones of animals varies in quantity according to the phase of the moon in which they are slaughtered. This question has also been examined by Rohault, who made a series of observations which were continued for twenty years with a view to test it; and the result was that it was proved completely destitute of foundation.

Supposed Lunar Influence on the Weight of the Human Body.—Sanctorius, whose name is celebrated in physics for the invention of the thermometer, held it as a principle that a healthy man gained two pounds weight at the beginning of every lunar month, which he lost toward its completion. This opinion appears to be founded on experiments made upon himself; and affords another instance of a fortuitous coincidence hastily generalized. The error would have been corrected if he had continued his observations a sufficient length of time.

Supposed Lunar Influence on Births.—It is a prevalent opinion that births occur more frequently in the decline of the moon than in her increase. This opinion has been tested by comparing the number of births with the periods of the lunar phases; but the attention directed to statistics as well in this country as abroad, will soon lead to the decision of this question.*

Supposed Lunar Influence on Incubation.—It is a maxim handed down by Pliny, that eggs should be put to cover when the moon is new. In France it is a maxim generally adopted, that the fowls are better and more successfully reared when they break the shell at the full of the moon. The experiments and observations of M. Girou de Buzareingues have given countenance to this opinion. But such observations require to be multiplied before the maxim can be considered as established. M. Girou inclines to the opinion that during the dark nights about new moon the hens sit so undisturbed that they either kill their young or check their development by too much heat; while in moonlight nights, being more restless, this effect is not produced.

Supposed Lunar Influence on Mental derangement and other Human Maladies.—The influence on the phenomena of human maladies imputed to the moon is very ancient. Hippocrates had so strong a faith in the influence of celestial objects on animated beings, that he expressly recommends no physician to be trusted who is ignorant of astronomy. Galen, following Hippocrates, maintained the same opinion, especially of the influence of the moon. Hence in diseases the lunar periods were said to correspond with the succession of the sufferings of the patients. The critical days or *crises* (as they were afterward called), were the seventh, fourteenth, and twenty-first of the disease, corresponding to the intervals between the moon's principal phases. While the doctrine of alchemists prevailed, the human body was considered as a microcosm; the heart representing the sun, the brain the moon. The planets had each its proper influence: Jupiter presided over the lungs, Mars over the liver, Saturn over the spleen, Venus over the kidneys, and Mercury over the organs of generation. Of these grotesque notions there is now no relic, except the term *lunacy*, which still designates unsoundness of mind. But even this term may be in some degree be said to be banished from the terminology of medicine, and it has taken refuge in that receptacle of all antiquated absurdities of phraseology—the law. Lunatic, we believe, is still the term for the subject who is incapable of managing his own affairs.

Although the ancient faith in the connection between the phases of the moon and the phenomena of insanity appears in a great degree to be abandoned, yet it is not altogether without its votaries; nor have we been able to ascertain that any series of observations conducted on scientific principles, has ever been made on the phenomena of insanity, with a view to disprove this connection. We have even met with intelligent and well-educated physicians who still maintain that the paroxysms of insane patients are more violent when the moon is full than at other times.

Mathiolus Faber gives an instance of a maniac who at the very moment of an eclipse of the moon, became furious, seized upon a sword, and fell upon every one around him. Ramazzini relates that, in the epidemic fever which spread over Italy in the year 1693, patients died in an unusual number on the 21st of January, at the moment of a lunar eclipse.

Without disputing this fact (to ascertain which however, it would be necessary to have statistical returns of the daily deaths), it may be objected that the patients who thus died in such numbers at the moment of the eclipse, might have had their imaginations highly excited, and their fears wrought upon by the approach of that event, if popular opinion invested it with danger. That such an impression was not unlikely to prevail

* Other sexual phenomena, such as the period of gestation, vulgarly supposed to have some relation to the lunar month, have no relation whatever to that period.

is evident from the facts which have been recorded.

At no very distant period from that time, in August, 1654, it is related that patients in considerable numbers were by order of the physicians shut up in chambers well closed, warmed, and perfumed, with a view to escape the injurious influence of the solar eclipse, which happened at that time; and such was the consternation of persons of all classes, that the numbers who flocked to confession were so great that the ecclesiastics found it impossible to administer that rite. An amusing anecdote is related of a village curate near Paris, who, with a view to ease the minds of his flock, and to gain to the necessary time to get through his business, seriously assured them that the eclipse was postponed for a fortnight.

Two of the most remarkable examples recorded of the supposed influence of the moon on the human body, are those of Vallisnieri and Bacon. Vallisnieri declares that being at Padua recovering from a tedious illness, he suffered on the 12th of May, 1706, during the eclipse of the sun, unusual weakness and shivering. Lunar eclipses never happened without making Bacon faint; and he did not recover his senses till the moon recovered her light.

That these two striking examples should be admitted in proof of the existence of lunar influence, it would be necessary, says M. Arago, to establish the fact that feebleness and pusillanimity of character are never connected with high qualities of mind.

Menuret considered that cutaneous maladies had a manifest connection with the lunar phases. He says that he himself observed in the year 1760, a patient afflicted with a scald-head (*teigne*), who, during the decline of the moon, suffered from a gradual increase of the malady, which continued until the epoch of the new moon, when it had covered the face and breast, and produced insufferable itching. As the moon increased, these symptoms disappeared by degrees; the face became free from the eruption; but the same effects were reproduced after the full of the moon. These periods of the disease continued for three months.

Menuret also stated that he witnessed a similar correspondence between the lunar phases and the distemper of the itch: but the circumstances were the reverse of those in the former case; the malady obtaining its maximum at the full of the moon, and its minimum at the new moon.

Without disputing the accuracy of these statements, or throwing any suspicion on the good faith of the physician who has made them, we may observe that such facts prove nothing except the fortuitous coincidence. If the relation of cause and effect had existed between the lunar phases and the phenomena of these distempers, the same cause would have continued to produce the same effect in like circumstances; and we should not be left to depend for the proof of lunar influence on the statements of isolated cases, occurring under the observation of a physician who was himself a believer.

Maurice Hoffman relates a case which came under his own practice, of a young woman, the daughter of an epileptic patient. The abdomen of this girl became inflated every month as the moon increased, and regularly resumed its natural form with the decline of the moon.

Now if this statement of Hoffman were accompanied by all the necessary details, and if, also, we are assured that this strange effect continued to be produced for any considerable length of time, the relation of cause and effect between the phases of the moon and the malady of the girl could not legitimately be denied; but receiving the statement in so vague a form, and not being assured that the effect continued to be produced beyond a few months, the legitimate conclusion at which we must arrive is, that this is another example of fortuitous coincidence, and may be classed with the fulfilment of dreams, prodigies, &c., &c.

As may naturally be expected, nervous diseases are those which have presented the most frequent indications of a relation with the lunar phases. The celebrated Mead was a strong believer, not only in the lunar influence, but in the influence of all the heavenly bodies on all the human. He cites the case of a child who always went into convulsions at the moment of full moon. Pyson, another believer, cites another case of a paralytic patient whose disease was brought on by the new moon. Menuret records the case of an epileptic patient whose fits returned with the full moon. The transactions of learned societies abound with examples of giddiness, malignant fever, somnambulism, &c., having in their paroxysms more or less corresponded with the lunar phases. Gall states, as a matter having fallen under his own observation, that patients suffering under weakness of intellect, had two periods in the month of peculiar excitement; and in a work published in London so recently as 1829, we are assured that these epochs are between the new and full moon.

Against all these instances of the supposed effect of lunar influence, we have little direct proof to offer. To establish a negative is not easy. Yet it were to be wished that in some of our great asylums for insane patients, a register should be preserved of the exact times of the access of all the remarkable paroxysms; a subsequent comparison of this with the age of the moon at the time of their occurrence would furnish the ground for legitimate and safe conclusions. We are not aware of any scientific physician who has expressly directed his attention to this question, except Dr. Olbers of Bremen, celebrated for his discovery of the planets Pallas and Vesta. He states that in the course of a long medical practice, he was never able to discover the slightest trace of any connection between the phenomena of disease and the phases of the moon. In the spirit of true philosophy, M. Arago, nevertheless, recommends caution in deciding against this influence. The nervous system, says he, is in many instances an instrument infinitely more delicate than the most subtle apparatus of modern physics. Who does not know that the olfactory nerves inform us of the presence of odoriferous matter in air, the traces of which the most refined physical analysis would fail to detect? The mechanism of the eye is highly affected by that lunar light which, even condensed with all the power of the largest burning lenses, fails to affect by its heat the most susceptible thermometer, or, by its chemical influence, the chloride of silver; yet a small portion of this light introduced through a pin-hole will be sufficient to produce an instantaneous contraction of the pupil; nevertheless the integuments of this membrane, so sensible to light, appear to be completely inert when otherwise affected. The pupil remains unmoved, whether we scrape it with the point of a needle, moisten

it with liquid acids, or impart to its surface electric sparks. The retina itself, which sympathizes with the pupil, is insensible to the influence of the most active mechanical agents. Phenomena so mysterious should teach us with what reserve we should reason on analogies drawn from experiments made upon inanimate substances, to the far different and more difficult case of organized matter endowed with life.

In conclusion, then, it appears that of all the various influences popularly supposed to be exerted on the surface of the earth, few have any foundation in fact. The precession of the equinoxes, the accumulated effect of which rendered necessary the alteration of the calendar, which produced the distinction between the old and new style, is a consequence of the moon's attraction combined with that of the sun upon the protuberant matter around the equatorial parts of the earth; and the nutation of the earth's axis, and the consequent periodical change of the obliquity of the ecliptic, is an effect due to the same cause. I have on another occasion shown that the tides of the ocean are real effects also arising from the combined attractions of the moon and sun, but chiefly of the former.

The precession of the equinoxes is a progressive annual change in the position of those points on the firmament where the center of the sun crosses the Equator on the 21st of March and the 21st of September. It has been ascertained by observation, and verified by theory, that these points move annually on the ecliptic with a slow motion in a contrary direction to the apparent motion of the sun; in consequence of which the sun, after each revolution of the ecliptic, meets these points *before* that revolution has been completed; consequently the sun's center returns to the same equinoctial point before it makes one complete revolution of the heavens: hence has arisen the distinction between a sidereal year, which is the actual time the earth takes to make a complete revolution round the sun, and an equinoctial or civil year, which is the period between the successive returns of the center of the sun to the same equinoctial point, and is the interval within which the periodical vicissitudes of the seasons are completed.

NEW USES OF IRON...IRON HARROWS.

In few branches of trade or manufacture is there probably greater latitude for extension than in the field which lies open for new uses of Iron. Every day suggests some new object for which it has not before been employed, and then the wonder is that it was never so employed before.

In Mr. Colman's last "European Agriculture," vol. i. part V. quoting Mr. I. Allen Ransome's treatise on the Implements of Husbandry, he says, on the subject of *Harrows*—"There are several varieties of Harrows, but, excepting the frame being made of iron instead of wood, and their being connected by hinges, so that the frame becomes, so to speak, flexible, I see no prominent excellence to be pointed out,"—and then quotes—"In an experiment made between a pair of wooden harrows and a pair of iron ones, constructed on the same plan, and having the same number and precisely the same disposition of the teeth and frames, although those of iron were found to be twenty pounds lighter than those of wood, yet the former worked decidedly better and steadier than the latter. In fact, the iron harrows cut into the land, while those made of wood rode, or rather danced, upon the surface." We confess we do not well see how this could be. If the wooden frame were *heavier*, why should the teeth not sink as deep? In respect of the *hinges* connecting the harrows and making them flexible, so as to accommodate their action to uneven surfaces, we have long had such harrows. In fact, our implement makers have all the best kinds, we are inclined to think, of that implement. Their own interest and public spirit, we trust, will prompt them to import samples, at least, of whatever is said or supposed to be superior in its kind. Their patrons have a right to judge for themselves; and we presume there will be few machines or implements adapted to our country that may not be seen in factories so immense as Ruggles and Moore's.

A late English paper says:

"The use of iron is still greatly extending in Manchester, where the principles of its application are well understood, and all the casting establishments are in active operation. The most novel application of this material is in the Independent Chapel erecting in Salford, near the Broughton Bridge, from the designs of Mr. Richard Lane. The roof is framed of cast iron principals, curved, and meeting at the top in a Gothic arch. Each half is in two pieces, firmly bolted together, and the principals are connected by tie-rods. The feet of the principals are spread out, and rest on blocks of stone, but are farther supported by iron columns, built into the wall, which stand upon stone corbels at the ground level. There are shoes, cast on the principals, to receive the purlins. There will be a school-room underneath. There are two hights of iron columns, the upper supporting the iron girders for the galleries. These girders are curved in form, so as to approach nearer to the section of the steps of the galleries."

AGRICULTURE IN THE STATE OF NEW-YORK.

Mr. KINNE, from the *Committee on Agriculture* in the New-York Assembly, has made a Report to the Legislature on so much of the Governor's Message as relates to the Farming interest. The Report strongly recommends the *State Agricultural Society* to the favorable notice of the Legislature—believing, as the Committee do, that through the instrumentality of the Society a great improvement has taken place in the practice of husbandry generally, in the breeding of cattle, and in the production of butter and cheese. The Report speaks well of the annual Fairs—of the favorable results of the sales of improved stock—of the Farmers' Clubs, and of the annual volume of the published Transactions of the State Society; but they are opposed to the State founding an Agricultural College or purchasing and sustaining an Experimental Farm. The following remarks we deem applicable to other States as well as New-York:

An abundance of statistical facts might be adduced, showing conclusively that, while the farmer of New-York has been growing rich, the fertility of her soil has been gradually but certainly diminishing. The fertility of a soil is usually measured by its capacity for growing wheat. Taking this as a test, it is but too evident that we have not overrated the fact that the fertility of New-York is diminishing. Wheat is rarely raised in the older Counties of the State, and in the fertile west the annual average per acre is diminishing. Many of the Counties of the State, formerly wheat-growing Counties, have of late years found that barley was a more certain and profitable crop, and they are, consequently, gradually abandoning the culture of wheat.

It is becoming known to the more enlightened agriculturists that the former ruinous practices of husbandry have contributed to the constant and annual removal from the soil of those peculiar elements which are necessary to secure the growth of wheat. To the great mass of our farmers, the doctrines of a well-founded Agricultural Chemistry are neither known nor appreciated. The enlightened statesman, therefore, who is anxiously looking after those causes which affect the prosperity of the commonwealth, must see, in this view of the subject, the absolute necessity of adopting a policy which is prejudicial to no one, and which may be beneficial to all.

There are many practices in use by our farmers that should be improved, if the case is within the reach of possibility. To select one out of many, we will mention that of "summer fallowing" for wheat. Can this practice be abandoned? If it can, the importance of correcting this habit will be evident to every one; for, by abandoning this questionable practice, one entire crop of grain will be saved to the farmer and the community, and, while the farmer's profits are thus increased, the price of bread will be cheapened to the poor laborer.

The community will never come to a right or a sound conclusion upon this subject until the feasibility of this plan is tested by so many contributors to the transactions of your Agricultural Societies, that there will be no reason to doubt the accuracy and the truth of their conclusions, nor until the full knowledge of all the details of the various experiments shall have been had in every hamlet and neighborhood of your entire State.

We might multiply instances that tend to prove that both the art of farming and the farmer will be alike improved by the course pointed out, but we forbear.

The prosperity of the farming community of the State of New-York will ever be an object of the deepest interest to her legislators. There are causes now at work which will sharply affect that prosperity for weal or woe. Should any cause materially depress the price of wool, and thus compel the farmers over a large portion of the State to seek in some other kind of husbandry a remuneration for their labor and capital employed, then will our agricultural interests be depressed below a point which they have not reached in the worst of times. That the wool-grower will have to contend, ere long, with adverse circumstances, is more than probable.—The ease and facility with which wool can be raised on the pampas of Brazil, and upon the prairies of the Western States, will, sooner or later, seriously affect that interest. Should this prediction be verified, adversity will compel the wool-grower of New-York to pay close attention to the breeding of animals which will clip the largest fleeces of the finest wool, and those that can be raised and sustained in the cheapest possible manner.

The Agricultural Society have not been blind to this state of things, and the course they have pursued has contributed most materially to the introduction of valuable breeds of sheep into this State. The Committee hope the Society will continue to encourage, by their wise policy, the exhibition of sheep from other States at their annual Fairs; for it is only by comparing carefully these animals, when placed side by side, that perfectly correct conclusions can be arrived at. The State of New-York has a deep interest in the thorough investigation of this subject.

A large portion of our State is yet in its native forest, nor can we reasonably hope that these waste lands will soon come under cultivation unless they are required for grazing. The butter and cheese dairies of the State are at present receiving fair encouragement. It is not probable that their prosperity will be soon or seriously affected. Should they receive from any cause, either foreign or domestic, a farther stimulus, its tendency will be to bring more of the wilderness of New-York into successful cultivation—a result most heartily to be desired. We

can see no possible means by which to hasten such an event, except by using the requisite means for diffusing a true knowledge of those principles, whether chemical or agricultural, upon which the dairyman's success depends.—No doubt whatever exists that the consumption of the articles of butter and cheese will be materially increased if the quality can be improved. Your Committee are prepared to believe that the butter and cheese dairies are in a state of rapid improvement. They infer this from the fact that, at the commencement of the Agricultural Societies, eminent dairymen were willing to compete for premiums, but were not willing to comply with the terms of the Society, by furnishing a full and detailed statement of the mode of operation, for fear of divulging the secret of their success. This illiberal prejudice is fast wearing away, and the beneficial effects resulting from the publications of the Society is being materially felt.

During the last year a Census has been taken, in which are embodied valuable details respecting the crops of this State. Your Committee forbear quoting from these statistics, as the whole is in course of publication. But your Committee are grieved to find that some of the crops returned, fall much short of the yield per acre from what might have been reasonably expected.—One of these—Wheat—has long been a staple of the State, and the falling off of this crop, in a large number of the older and more populous Counties of the State, is a serious public calamity; not only because it diminishes the profits of the farmer, but because it drains these Counties of a large amount of specie to furnish these breadstuffs, which are indispensable for their subsistence and comfort.

This calamity is owing in a great measure to the ravages of the Wheat-Fly; an evil which does not seem to abate, and for which there seems to be no certain cure. Although the evil cannot be eradicated, the Committee believe that in the papers of the Society, will be found a detail of a method of culture which will measurably alleviate, if not entirely avoid, the ravages of the weevil.

In common with several European countries, this State has been visited with a disease which has seriously affected both the yield and quality of the poor man's esculent—the Potato. The average yield of this valuable root ought to be nearly if not quite two hundred bushels per acre, throughout the entire State, and yet from the Census returns, it does not amount to more than ninety. This calamity early arrested the attention of the State Society, and they are ready to believe that the communications which they are about to publish will have a decided and beneficial effect upon the culture of this inestimable root. Unless this is the fact, and the disease goes on increasing in intensity and malignity, the most serious consequences will ultimately be realized. Already a less quantity of land is planted with potatoes by the farmer. Thus the amount of the crop is diminished, and if it is still farther diminished by disease, the poor will severely suffer.

It is a singular fact that the restrictive policy which has closed the ports of England against the world, was commenced in the reign of Elizabeth—during whose reign the potato was first introduced into Europe—and that owing to the lamentable failure of this national root crop, this restrictive policy is about to be abandoned.—Strange that so humble an agricultural production should have such momentous influence upon the destinies of great nations!

In connection with this subject, your Committee would remark, that the American farmer must have his attention drawn to the use of salt as manure in an especial manner. Salt has not been used for this purpose to any very great extent, as your Committee learn. Yet it has been satisfactorily proven by numerous experiments in the County of Onondaga and elsewhere, that the free use of salt has very much added to the yield of the land.

This is an important fact; yet there is something connected with the use of salt as manure of almost equal importance; that is, the unparalleled agency of salt in destroying insects of almost every kind. No farmer should neglect to use salt as a manure upon all those fields liable to the pestiferous ravages of the grub, wire-worm and caterpillar. In gardens it is invaluable, especially in those which have long been worked and are very rich. The disease of the potato, before mentioned, whatever may be its cause, is found to yield its virulence to the agency of salt, and no potato crop should be planted without salt being used, in whole or in part, as a manure.

There is also good reason for believing that where salt is used for manure, the disease of the Wheat crop, known by the name of rust, which more or less every year affects it injuriously, will be measurably abated if not wholly averted. At all events, it is well established, that in one particular district of England, where old brine has long been used as a manure, rust rarely if ever makes its appearance. It is true that there is a wide difference between the cold, damp climate of England, and the hot and dry climate of New-York. Still the subject deserves the especial attention of the New-York farmer.

To take the Honey without destroying the Bees.—In the dusk of the evening, when the bees are quietly lodged, approach the hive, and turn it gently over. Having steadily placed it in a small pit, previously dug to receive it, with its bottom upward, cover it with a clean new hive, which has been properly prepared, with a few sticks across the inside of it, and rubbed with aromatic herbs. Having carefully adjusted the mouth of each hive to the other, so that no aperture remains between them, take a small stick, and beat gently round the sides of the lower hive for about ten inches or a quarter of an hour, in which time the bees will leave their cells in the lower hive, ascend, and adhere to the upper one. Then gently lift the new hive, with all its little tenants, and place it on the stand from which the other hive was taken. This should be done some time in the week preceding Midsummer-day, that the bees may have time, before the summer flowers have faded, to lay in a new stock of honey, which they will not fail to do, for their subsistence through winter.

[Cooley's Cyclo. of Prac. Receipts.

Apple Sugar.—Express the juice, and add chalk until the whole of the acid is saturated; pour off the clear liquor; then clarify by boiling in a clean pan with some white of egg; skim off the dirt; and lastly evaporate by a gentle heat to a proper consistence. *Remarks.* 1 cwt. of apples yield about 84 lbs. of juice and 12 lbs. of crude sugar. [Cooley's Cyclo. of Prac. Rec.

From the New-York Albion.

DIRECTIONS FOR USING INDIAN CORN.

Dear Sir: If the very interesting pamphlet addressed by you to *Lord Ashburton* in 1842 on the introduction of *Indian Corn, free of duty, into Ireland*, could have had a circulation in England proportioned to the importance of the subject, and the ability with which it was there presented, it could not have failed in making an impression on that Government, and might have gone far to mitigate the calamity under which there is too much reason to fear Ireland is now suffering.

It is, however, an interesting fact to know, that gentlemen are now writing out to their correspondents in this country, to send them small parcels of the nicest samples of *Indian Corn Meal*; and it is important to the last degree, that nothing shall happen to discourage these essays to bring that great staple of our country into popular use in England. Under that persuasion, I think it of some importance not only that measures be taken to accompany these samples with the best culinary instructions, but to suggest, what from the best information I believe to be true, that a little depends on the *region of our country where the corn has been produced.*— The facts which seem worthy of regard as to corn, and which influence its quality for *leavening or lightening, and for keeping sweet*, apply as well to *Wheat* as to *Indian Corn.*

Nothing is better known, than that *Richmond Flour* commands a better price, especially in the South American markets, and other warm climates generally, than flour manufactured *farther North.* Why is this? No machinery can be better, nor manufacture more perfect than that of *Rochester* or *Baltimore!* Yet Richmond Flour will keep better, absorb more water and make more bread; in a word, remain sound longer, and *go farther* when made into bread. The cause of this is to be found, I am well persuaded, in the *drier and lighter* wheat of the Southern growth, and the more *spongy and absorbent* nature of the flour. If we had flour manufactories yet farther South, the flour would be equally as good, and as much in demand, as the Richmond brand, if as well manufactured. But the fact is, I understand, that Northern wheat is heavier than Southern wheat, has more gluten in it, is *moister*, and hence will not keep so long, or make as good flour for the baker. The same thing may be said probably of *Indian Corn;* that, as well as oats, and other Northern grain, or grain grown in *mountainous regions* South, is *heavier* than Southern corn and other grains along the Southern sea-board, which supplies Richmond with wheat. Much of their supply comes from James River and south of it. Now my fear is, that all the experiments made in England and Ireland with Indian Corn Meal, will be with *Northern corn*, going from the port of New-York, heavier and better for stock, but not for men who are to be converted to the use of it. At the City Hotel, where I live, and where the cooking department (as well as all others,) is managed with great care and skill, the corn bread, though much in demand at the table, and judiciously made, is not comparable with such as you meet with on the table of a *Virginia Housewife.* It will be clammy and solid when broken or cut. The cakes too, are adhesive, and not light, porous and open like a honey-comb. In the South, make the "Indian bread" as you may, it will be *light and dry*, mix and bake it as you will.

It is but proper to add, that the suggestions I have here made, of the validity and soundness of which I have no doubt, are the result of a recent conversation with T. J. Randolph, Esq., a grandson of Mr. Jefferson, and who, true to his blood on that subject, was recently a conspicuous member of the Education Convention at Richmond.

The views I have thrown out, are corroborated by the following extract from a recent number of the London *Mark-Lane Express.*

"A Subscriber in your paper of September 15, asks why wheat in the present day becomes injured and rots quicker than used to be the case in remote times, when it was stored away and kept sound for an indefinite period? Could the wheats so stored away have been similar to the kinds now cultivated?" He also inquires, whether the Egyptians and other people in the earlier ages of the world cultivated other than the bearded and many-spiked wheats cannot now be decided, but the Romans were acquainted with both winter (or beardless) wheats and the true spring wheat, which is termed "tremois," or three months, on the Continent, &c., in the present day. The great stores of wheat gathered up with a government influence and for national purposes at the times "Subscriber" alludes to, will be found to have been chiefly in the south of Europe and the north of Africa; and as the wheats of those districts are both harder and tougher in the present day than those of the north of Europe, and also contain less moisture, it is only natural to infer that there was the same coincidence of circumstances in olden times; and as the natural quantity of moisture in wheat will be increased in the north of Europe *to perhaps double the quantity it contains in the south, so also will the chances against its keeping for any long period be more diminished the farther we recede from the tropical portion of the earth.* Moisture therefore in wheat must be considered as one of the principles which tend to its decay; and although artificial means, as kiln drying, may be used for robbing it of a considerable portion of the moisture, yet it does not appear probable that any such process will ever render the soft wheats of the north so well adapted for keeping as the hard and horny wheats of warm countries.

I have only to repeat the expression of my hope that the experiments in England will not be generally on the flour of Indian Corn of northern growth, which would be very unfavorable to success; but if gentlemen sending their articles to their correspondents would procure it from Richmond, or south of the Chesapeake, and with it send a copy of the recipes I have append-

ed to this, for making EGG PONE and VIRGINIA CAKES, I will undertake to promise that they will become the favorite bread at the breakfast table of QUEEN VICTORIA herself, as the Indian Meal *Ash Cake* ever was with GEN. WASHINGTON. It shall even augment the desire which she, and it is to be hoped every Christian human being entertains, to preserve peace and all sorts of kind offices between the mother and the daughter country.

Yours with best wishes, J. S. SKINNER,
Editor of Farmers' Library.

New-York, Dec. 1845.

TO MAKE GRIDDLE CAKES.—Best way to make them is to use milk altogether, instead of water—two eggs, yellow and white, to be allowed for a pint of corn meal—the milk to be a little warmed, and the whole to be well beaten up with a spoon or ladle. There must be milk enough used to make the whole so liquid as that it will *pour* out of the saucepan on the *griddle*—one spoonful of wheat flour, and lard (*pure* butter still better) the size of a walnut.

THE GRIDDLE.—Much nicety is to be observed in the preparation of the griddle, which, as must be well known, is a *flat* round iron concern standing on three legs, and of any size—it must be made not *very* hot, because then it would burn the cakes, and it must be well cleaned and greased while warm, that it may be *perfectly smooth*, so that the cakes may be easily turned, that they may be done *brown* (not burnt) on both sides—to promote their turning easily is the object of adding the wheaten flour. Be it remembered that the dough, or rather batter, as directed, must be well beat up and prepared directly before being cooked—though it might set an hour—this is mentioned to prevent its being supposed that it, like some other bread, would bear to be mixed over night. The cakes are usually poured on until they spread on the griddle to the size of the bottom of a breakfast plate. You will think this recipe rather prolix, but it is my way in all such cases to be very exact. Better be too particular than to omit any essential item. J. S. S.

EGG PONE.—Three eggs to a quart of meal—no wheat flour—to be made also with milk—water would make it heavy—a spoonful of butter, all well beat together and made up of a consistence thicker than the cakes—too thick to *pour* out—but just thick enough to require to be taken up with a spoon—may be baked like the cakes, immediately after being mixed—must be baked in a tin pan, which must be placed in a Dutch oven, not *too hot* at first, but the fire under it to be increased. The object is to have it begin to bake *at the bottom*, when it will *rise* in the process of baking, become brown on the top, and when put on the table and cut, resemble what we call *pound-cake*. If your friend will exactly follow these directions, and then eat his cakes, or his egg-pone, *hot*, with good fresh butter, he will find that Indian Corn bread is fit for *other persons* as well as *pigs* to eat, the assertion of a corn-law Member of Parliament to the contrary notwithstanding. Divers other preparations of corn and Corn Meal might be given. For instance "hominy and ash-cakes," which a certain *George Washington* had cooked for his own eating to the day of his death. J. S. S.

P. S.—Salt, of course, add as usual, in both cases.

THE POWER OF FASCINATION IN SERPENTS.

THERE is a very general opinion, which has been adopted, even by some eminent naturalists, that several species of serpents possess the power of fascinating birds and small quadrupeds, by fixing their eyes upon the animal, so that the poor victim is unable to escape from his formidable enemy. Dr. Barton, of Philadelphia, published, in 1796, a "Memoir concerning the fascinating faculty which has been ascribed to the Rattlesnake, and other American Serpents," in which he maintains that this supposed power of fascination does not exist, and offers some ingenious explanations of the origin of what he considers a popular mistake. Our readers will, we think, be interested by an extract or two from this work:

"In conducting my inquiries into this curious subject, I endeavored to ascertain the two following points, viz., first, what species of birds are most frequently observed to be enchanted by the serpents? and, secondly, at what season of the year has any particular species been the most commonly under this wonderful influence? I supposed this would furnish me with a clue to a right explanation of the whole mystery.

"Birds have an almost uniform and determinate method of binding their nests, whether we consider the form of the nest, its materials, or the place in which it is fixed. Those birds which build their nests upon the ground, on the lower branches of trees, and on low bushes (especially on the sides of rivers, creeks, &c. that are frequented by different kinds of serpents,) have most frequently been observed to be under the enchanting faculty of the Rattlesnake, &c. Indeed, the bewitching spirit of these serpents seems to be almost entirely limited to these kinds of birds. Hence we so frequently hear tales of the fascination of our cat-bird, which builds its nest in the low bushes, on the sides of creeks, and other waters, the most usual haunts of the black snake and other serpents. Hence, too, upon opening the stomachs of some of our serpents, if we often find that they contain birds, it is almost entirely those birds which build in the manner I have just mentioned.

"The Rattlesnake seldom, if ever, climbs up a tree. He is frequently, however, found about their roots, especially in wet situations. It is said that it is often seen curled round a tree, darting terrible glances at a squirrel, which after some time is so much influenced by these glances, or by some subtle emanation from the body of the serpent, that the poor animal falls into the jaws of its enemy. Is the animal's fear and distress a matter of any wonder? Nature has

taught different animals what animals are their enemies; and as the Rattlesnake occasionally devours birds and squirrels, to these animals he must necessarily be an object of fear. Sometimes the squirrel drives away the serpent, but occasionally approaching too near his enemy,

[Baltimore Oriole defending her Nest from the Black Snake.]

he is bitten or immediately devoured. These hostilities, however, are not common.

"In almost every instance, I have found that the supposed fascinating faculty of the serpent was exerted upon the birds at the particular season of their laying their eggs, or of their hatching, or their rearing their young, still tender and defenceless. I now began to suspect, that the cries and fears of birds supposed to be fascinated originated in an endeavor to protect their nest or young. My inquiries have convinced me that this is the case.

"I have already observed, that the Rattlesnake does not climb up trees; but the black snake and some other species of the Coluber do. When impelled by hunger and incapable of satisfying it by the capture of animals on the ground, they begin to glide up trees or bushes upon which a bird has its nest. The bird is not ignorant of the serpent's object. She leaves her nest, whether it contains eggs or young ones, and endeavors to oppose the reptile's progress. In doing this, she is actuated by the strength of her instinctive attachment to her eggs, or affection to her young. Her cry is melancholy, her motions tremulous. She exposes herself to the most imminent danger. Sometimes she approaches so near the reptile that he seizes her as his prey. But this is far from being universally the case. Often she compels the serpent to leave the tree, and then returns to her nest.

It is a well-known fact, that among some species of birds, the female, at a certain period, is accustomed to compel the young ones to leave the nest; that is, when the young have acquired so much strength that they are no longer entitled to *all* her care. But they still claim some of her care. Their flights are awkward, and soon broken by fatigue: they fall to the ground, when they are frequently exposed to the attacks of the serpent, which attempts to devour them. In this situation of affairs, the mother will place herself upon a branch of a tree, or bush, in the vicinity of the serpent. She will dart upon the serpent in order to prevent the destruction of her young; but fear, the instinct of self-preservation, will compel her to retire. She leaves the serpent, however, but for a short time, and then returns again. Oftentimes she prevents the destruction of her young, attacking the snake with her wing, her beak, or her claws. Should the reptile succeed in capturing the young, the mother is exposed to less danger. For, while engaged in swallowing them, he has neither inclination nor power to seize upon the old one. But the appetite of the serpent tribe is great: the capacity of their stomachs is not less so. The danger of the mother is at hand when the young are devoured; the snake seizes upon her; and this is the catastrophe which crowns the tale of fascination!

"Some years since, Mr. Rittenhouse, an accurate observer, was induced to suppose, from the peculiar melancholy cry of a *red-winged maize-thief*, that a snake was at no great distance from it, and that the bird was in distress. He threw a stone at the place from which the cry proceeded, which had the effect of driving the bird away. The poor animal, however, immediately returned to the same spot. Mr. Rittenhouse now went to the place where the bird alighted, and, to his great astonishment, he found it perched upon the back of a large black snake, which it was pecking with its beak. At this very time the serpent was in the act of swallowing a young bird, and from the enlarged size of the

reptile's belly, it was evident that it had already swallowed two or three other young birds. After the snake was killed the old bird flew away. Mr. R. says that the cry and actions of this bird had been precisely similar to those of a bird which is said to be under the influence of a serpent. The maize-thief builds its nest in low bushes, the bottoms of which are the usual haunts of the black snake. The reptile found no difficulty in gliding up to the nest, from which, most probably in the absence of the mother, it had taken the young ones; or it had seized the young ones after they had been forced from the nest by the mother. In either case the mother had come to prevent them from being devoured."

☞ From time to time we will publish in the Farmers' Library such Tables as may be of practical use on Farms. The following can hardly fail to prove a convenience to almost every Farmer:

PLANTING.

A Table *showing the Number of Plants required for One Acre of Land, from one foot to twenty-one feet distance from Plant to Plant.*

Distance. Feet.	Inches.	Number.	Distance. Feet.	Inches.	Number.	Distance. Feet.	Inches.	Number.
1	0	43,560	6	0	1,210	12	0	302
1	6	19,360	6	6	1,031	13	0	258
2	0	10,890	7	0	889	14	0	223
2	6	6,969	7	6	775	15	0	194
3	0	4,840	8	0	680	16	0	171
3	6	3,556	8	6	602	17	0	151
4	0	2,722	9	0	538	18	0	135
4	6	2,151	9	6	482	19	0	121
5	0	1,742	10	0	436	20	0	109
5	6	1,440	11	0	361	21	0	99

A TABLE FOR MANURING LAND.

Explanation.—The following Table is intended as a guide in ascertaining the distance and size of the heaps proper for expending a given number of loads per acre, or *vice versa*. In the left-hand columns is placed the distance of the rows and of the heaps in each row, and at the top of the columns will be noticed the number of heaps intended to be made of each load; the point where the two meet gives the number of loads per acre which will be required for that purpose.

Example 1.—Required the number of loads necessary to manure an acre of ground, dividing each load into 6 heaps, and placing them at a distance of 4½ yards from each other? The answer by the Table is 39¾.

Example 2.—A farmer has a field containing 5½ acres, over which he wishes to spread a mixen containing 82 loads of dung. Now 82 divided by 5½ gives 15 loads per acre; and by referring to the Table it will be seen that the desired object may be accomplished by making 4 heaps of a load, and placing them 9 yards apart; or by 9 heaps at 6 yards, as may be thought most advisable.

Distance of the heaps.	Number of heaps in a load. 1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
3 yards	538	269	179	134	108	89½	77	67	60	54
3½ "	395	198	132	99	79	66	56½	49½	44	39½
4 "	303	151	101	75½	60½	50½	43¼	37¾	33½	30¼
4½ "	239	120	79½	60	47¾	39¾	34¼	30	26½	24
5 "	194	97	64½	48½	38¾	32¼	27¾	24¼	21½	19¼
5½ "	160	80	53½	40	32	26¾	22¾	20	17¾	16
6 "	134	67	44¾	33½	27	22½	19¼	16¾	15	13½
6½ "	115	57½	38¾	28¾	23	19	16¼	14¼	12¾	11½
7 "	99	49½	33	24¾	19¾	16½	14	12¼	11	10
7½ "	86	43	28¾	21½	17¼	14¼	12¼	10¾	9½	8½
8 "	75½	37¾	25¼	19	15¾	12½	10¾	9½	8¼	7¾
8½ "	67	33½	22¼	16¾	13½	11¼	9½	8½	7½	6¾
9 "	60	30	20	15	12	10	8½	7½	6¾	6
9½ "	53½	26¾	18	13½	10¾	9	7¾	6¾	6	5¼
10 "	48½	24¼	16¼	12	9¾	8	7	6	5½	4¾

MARL.

A LETTER ADDRESSED TO THE AGRICULTURAL SOCIETY OF JEFFERSON COUNTY, GA.

BY J. H. HAMMOND.

We have rarely read any disquisition with as much pleasure as the "Letter" on Marl, from Governor Hammond, which enriches this Number of the Farmers' Library and Monthly Journal of Agriculture.

To designate particular portions of it as worthy of especial regard might imply that others were comparatively less so; whereas we may safely commend the whole to the most careful perusal; but what does gratify us particularly is, the general impression which it cannot fail to make, to the effect that our exhausted lands must now be regenerated, and the old States, if not altogether abandoned, must be redeemed by the exercise and application of *mind to the pursuits of the husbandman!* Mere brute force, however great, mere *drudgery*, however persevering, is unequal to the gigantic undertaking. Industry must not only be untiring, but, to be efficient, it must be *well directed*. As well might we expect the unwieldy giant, altogether unskilled in the use of the small-sword, to prevail against the most accomplished master in the art of fencing, or the latter to avail himself, blindfolded, of that elegant accomplishment, as to expect the mere stolid, uninstructed farmer to use his materials most advantageously without possessing any knowledge of their nature or mode of operation.

For readers in those districts where *Gypsum*, or Plaster of Paris acts, as it does in some portions of Maryland, with great efficacy, we might emphasize that passage in the letter where the author says that one peck per acre, applied to the moistened seed, will probably have as much effect, for one year at least, *as any other quantity*, adding that in the last dry season it had on his land, applied in that way, double the effect of a bushel sowed broadcast. The *cotton planter*, too, will not fail to heed the remark that gypsum applied to the cotton seed at the rate of only one peck to the acre on marled land, increased the product one-third.

We remember, on this point, to have heard Mr. Talbot, of Prince George County, Maryland, a very practical planter of the soundest judgment say, that on some occasion the gypsum which had been applied at the rate of a bushel an acre, being nearly exhausted, he ordered half the quantity to be sowed on the residue of the field; and that in the result he could perceive no difference between that part which was sowed at the rate of one bushel, and that which got but half the quantity. There is in fact yet some mystery to be solved about the action of gypsum, which must be done by some investigating member of a class of men, whom the ignorant and prejudiced find it convenient to jeer at and denounce as "*Book Farmers!*" and what are books, but the printed conversation and disclosures of men, who instead of hiding their lights under a bushel for sinister ends, choose rather to put their experience on paper and let it take form, pressure and circulation for the public good?

Incidentally, too, we derive pleasure from this letter, seeing that it does justice to the merits and services of Mr. Ruffin, who, were it only in his illustrations of the properties and uses of *Marl*, has rendered more benefit to the country than any five hundred mere political speech-makers in it.

At the same time, too, we may be permitted the occasion, not knowing when another may offer, to render slow and feeble justice to an old *Maryland* patriot, who, though it may be but little known to fame, is not the less deserving the small honors which the public seems to pay so grudgingly to *civil* worth. We allude to the agency, many years since, of the late Col. Singleton of Talbot County, Maryland, whose name would be as familiar as it is comparatively unknown, to the general ear, if he had done a tithe as much to exemplify the art of destroying, as he did to advance that of *feeding* his fellow men.

Our own recollections connected with what was done to disseminate a knowledge of the value of Marl as a fertilizer, are, we must confess, but ill defined; but our earliest reminiscences, nevertheless, in reference to Maryland Agriculture, and the means of recruiting her exhausted fields, carry us back distinctly, among others, to Col. Singleton as perhaps, until his day, the first and the only systematic *marler* in that respected and by us ever to be beloved old Commonwealth.

Will some friend "of that ilk," more familiar with what he said and did, give us a sketch of it.

if only in the way of simple justice—better late than never—to a quiet, rural benefactor? Some such brief memorial may serve at the same time to mark the errors, the variations and the progress of improvements which have attended, in our country, the use of one of the greatest resources provided by Nature to stem the current of exhaustion that must ever accompany the tillage of the earth, when not counteracted by art and the means placed by Nature within the reach of the *cultivated and thinking husbandman!*

SILVER BLUFF, S. C., Jan. 5th, 1846.

Dear Sir: I embrace the earliest opportunity my other engagements have allowed me, of fulfilling my promise to comply with the request of your Society, to give them such information as I possess in regard to marl. I am happy to learn that an interest in this matter has been excited in your County, and if in what I am about to say, I shall fail to meet all the inquiries which might be made, it will afford me great pleasure to communicate more fully on particular points, at any time hereafter.

Aware of the strong prejudice existing too generally among farmers against everything *new* in farming, it may not be amiss for me to begin by saying that however new to us marling may have been a few years ago, it is in point of fact one of the very oldest agricultural operations of which we have any authentic record. Pliny, who wrote during the first century of our era, mentions marl as having been long in use among the Greeks and also in Gaul and Britain. He describes pretty accurately the appearance of all, or nearly all, the kinds of marl now known. He even specifies the peculiar effects of each on soils, and states the length of time these effects were supposed to last, which was from ten to eighty years, according to the quality of the marl and the land marled. Varro, who wrote a century before Pliny, mentions having seen fields in Gaul covered with a "white fossil clay," and also describes several varieties of marl as in common use.

Although these writers, because ignorant of the discoveries of modern science, made great blunders in attempting to account for the extraordinary influence exerted by this earth on vegetation, and to discriminate between its varieties, still it is unquestionable that the "*leucargillon*" of the Greeks, the "*fossicia creta*" of Varro and the "*marga*" of Pliny, were no other than the same kinds of marl we find here, and which at this day so many enterprising farmers, both in Europe and America, are actively and extensively engaged in spreading over their fields, and which have been continuously used for that purpose more or less from the remotest ages. Marling, then, is certainly no novelty—no untried experiment, that can for a moment be classed among modern humbugs.

There is no question, however, that the want of chemical knowledge has in time past led to great errors in its application and consequent failures—often to serious injury from its use. When the element in marl which gives it its chief virtue, and also its certain and its probable chemical action on the soil and its growth, were all unknown, every new application of it was to some extent an experiment which might or might not succeed. It is a great proof of its universal value, that so many succeeded as to maintain its reputation and consequent use. Mr. Ruffin of Virginia, was the first in this country to explain on scientific principles the true nature of marl, its mode of action, and the proper manner of applying it, and to carry his theory through the ordeal of successful experiment. He is the founder of the marling system among us, for which he will be long and deservedly ranked among public benefactors. His "Essay on Calcareous Manure" contains everything that is important to know about marl and marling. Throughout my operations, it has been my guide, and it is still, I believe, far in advance of anything that has yet been published in any country, on the subject. If I thought every member of your Society would procure a copy of that Essay, and peruse it carefully, I might close my letter here, by earnestly recommending them to do so. It is with the hope of inducing some of them to do it, as well as to testify my respect for them, by responding to their inquiry, that I proceed.

Marl, as correctly defined by Mr. Ruffin, and now known in this country, is calcareous earth, that is, earth containing lime. The lime found in it is united for the most part with carbonic acid, and is therefore called carbonate of lime. It sometimes contains lime in other combinations, as sulphate and phosphate of lime. Azote has been found in marl also, and magnesia is not uncommon. Besides these, it contains sand and clay in various proportions, and occasionally a green sand highly prized as a manure on account of its being rich in potash. All of these constituents are valuable to the farmer. But it is the quantity of carbonate of lime in it which gives its character to marl, and by which it is estimated when it is called rich or poor.

Nothing is more deceptive in appearance, and the most experienced are liable to great mistakes, if they attempt to estimate its value by the eye, and without employing the proper chemical test. There is a rock found in abundance in your County, and which is of great value for other purposes, that has deceived many. It seems to be a mass of shells; but the fact is, they are only effigies, or casts, from which every particle of lime has been long since washed away, and sand deposited in its place. There is also a fine, soapy earth, usually of a pale ash color, though sometimes darker, that many have regarded as very rich marl. This is what was formerly, and by foreign writers is still denominated clay marl. It seldom contains much lime, and is generally wholly destitute of it even when found in marl beds. This soapy feeling is a very uncertain indication of lime. Where it is observed in marl, it is usually owing to something else, chiefly to magnesia or alumina. A marl is found whiter and harder than the earth to which I refer, but of the same lamellated structure and a somewhat soapy touch, that is exceedingly rich in lime—that at Shell Bluff containing 90 odd per cent. of the carbonate. It yields readily to the knife, crumbles when exposed to a severe freeze, and is altogether the most valuable marl we have. Unfortunately, it is not met with in large quantities in our formation. In our marl beds immense quantities of large shells are generally found. Inexperienced marlers have been known to spread these on their land. But they are of little or no value, unless burned or crushed. They were deposited where they are found before the human race inhabited the earth, and being for the most part sound yet, will yield little or no

lime to the soil in our day. Even the masses of much smaller, conglomerated shells, though very rich in lime, are not among the most valuable marls, unless broken up and pulverized to a considerable extent. There is a marl abounding with us, which to the naked eye seems to be mere sand, that is much more valuable, though it does not contain two-thirds of the quantity of carbonate of lime: mixes at once with the soil and exerts its full influence in a comparatively short period. The most valuable marl, practically speaking, that is found in any quantity at Shell Bluff—and will be found in your marl-beds, for the formation is the same—is composed of very fine shells, scarcely discernible, which are loosely cemented together and readily fall apart. It is of different colors; mostly white, sometimes purplish, yellow, or light brown. The most abundant marl found in our formation is hard and compact, of a gray color, containing 50 to 60 per cent. of lime, and crumbles on exposure to the seasons and in handling.

But, as I have said, the value of marl cannot be estimated by its appearance. Between earth which contains 75 per cent. of carbonate of lime, and that containing 20 per cent. or even none at all, the most experienced are far oftener than otherwise unable to distinguish without using the proper tests. These are so readily to be procured, and in fact the analysis of marl, so far as to ascertain the quantity of carbonate of lime, is so very simple an operation, that the marler should leave nothing to conjecture on this important point. Earth containing any notable proportion of carbonate of lime, will effervesce if thrown into vinegar or almost any acid. But the best test is muriatic acid: a single drop of it will produce immediate effervescence whenever there is carbonate of lime in any marl, it is only necessary to have this acid, a pair of apothecaries' scales with weights, and a wide-mouthed vial. Dry the marl thoroughly on a shovel, over the fire, and pound it in a mortar to a fine powder. Fill the vial about one-third with the muriatic acid diluted with two parts of water to one of acid, and balance it exactly in the scales, with weights of any kind. Then add, very slowly, 100 grains of the powder previously weighed, taking care not to make it effervesce so rapidly as to throw any of it out of the vial. When the effervescence has completely ceased, blow gently into the mouth of the vial, with a common bellows, to expel any of the carbonic acid gas which may have remained in it in consequence of its being heavier than the atmospheric air. Weights to the amount of 100 grains must now be put in the opposite scale to balance the 100 grains of powdered marl put into the vial. It will be found that in consequence of the escape of carbonic acid in a gaseous form, the scale with the vial will rise: put weights into it then until the scales are once more exactly balanced—the number of grains put in the scale with the vial will of course indicate the weight of the carbonic acid that has escaped. Now carbonate of lime contains in 100 parts very nearly 56 parts of lime and 44 of carb. acid. If, then, 44 grains have escaped in your analysis, the specimen is pure carbonate of lime. If only 22 grains have escaped, then it contains but 50 per cent. of carbonate of lime. And so in proportion to any quantity of carbonic acid which may have been expelled. In practice, it will be found most convenient to use 50 grains of the powdered marl. A very few trials will enable the most inexperienced farmer to ascertain in half an hour with sufficient precision the value of his marl. That value depending mainly, as stated, on the quantity of carbonate lime which it contains.

The value of lime for agricultural purposes, is not only established by the experience of all ages, and, so far as we know, of all countries, but must be obvious, when it is known that chemical analysis has detected it as a constituent of every vegetable that grows on the surface of the earth. It is also the chief element of the bones of every animal—even of those that feed on grass only. It is, therefore, not only beneficial, but indispensable to the growth of all kind of vegetation. The all-bountiful Creator has diffused it over the whole globe, as extensively as almost any known substance. But like all His gifts, it has been, for wise and good purposes, no doubt, unequally distributed. That it is placed, in some form and to some extent, within the reach of all plants, is certain, since they all contain it. And a late scientific writer on Agricultural Chemistry in our country, has attempted to prove that all—even the poorest soils, possess an ample supply of it to furnish heavy crops of vegetation for countless years to come. If this were true, it would be worse than useless to expend labor in spreading it over our lands; millions of farmers besides myself have acted very foolishly, and you would do well to think no more of marling. But this is plainly not the case. There are a great many soils in which the chemical tests now known, have failed to find a trace of it. Such is the fact with regard, I believe, to all the land I cultivate. Such, I will venture to say, it is with regard to most, if not all of the lands in your County; though I am aware you have had pretended analyses made, which exhibited large proportions of lime. The reasoning of the writer alluded to, is this: All soils are formed by the disintegration and crumbling of rocks. Most rocks contain lime, especially those which disintegrate most readily and form soils. He calculates the amount of lime in the quantum of rock necessary to create a soil of a certain depth, and thence infers that there is so much lime in the land. There is no doubt that the rocks from which your soil and mine were formed, contained lime to the amount estimated, but it is equally certain that these rocks, in their transition from one state to another, were subjected for an indefinite period to the action of water. I am speaking particularly of our immediate section of country. The ocean once undoubtedly covered it as high up as the Falls of our rivers and the belt of sand-hills which runs through the middle districts of South Carolina and Georgia, and held it as permanent domain. During this period, our marl beds were deposited—possibly also our present surface of earth. But whether that be so or not, and whether the surface we now cultivate belongs to the Eocene formation, as these marl deposits are supposed to do, or to the Post Pliocene, or, as is most probable, to the Diluvial, it is evident, from the irregular inter-stratification of different kinds of earth, and the rounded pebbles on and in it, to a considerable depth, which could have been rounded only by the action of water, that the whole of it, like the sand and clay now constantly brought down our streams, has been at some remote period, "drifted" from a higher region, and deposited by water here. The lime in the rocks being soluble under circumstances which must have attended the "drift," was re-

tained and carried away in the currents. Our marl beds were probably deposited at a much earlier geological era, and have no connection with the soil on our present surface, but were upheaved or denuded in some of those great convulsions to which our globe has been every where subjected. That our lands are for the most part destitute of lime is certain. That it has been taken from them in this way, is more than probable. The masses of silicified shells to which I have already alluded, and which are so abundant in your County, prove that the lime may be entirely carried off by water.

But if there is no lime in the soil, from what source do the growing plants derive this indispensable constituent, may well be asked. It has been often asked. Nature has not revealed, and Science has as yet failed to discover an answer satisfactory to all. Whether, as is conjectured by some, the unknown vital action of the plant is sufficiently powerful and comprehensive to *create* the requisite modicum—or whether it can, as others suppose, by some galvanic agency, extract it from sources where its existence has not yet been detected by chemical reagents, is yet a mystery. But this much experience has established and science demonstrated, that where lime cannot be found in fair proportions in a soil, the health and vigor of the plants growing on it can always be materially improved by a judicious application of it. And to this conclusion common sense, without experience or science, would lead every one who was aware that it is invariably an element in all vegetable matter.

The precise rationale of the action of lime on the soil, and the manner in which it benefits vegetation, has never been fully and minutely explained. Nature still holds many of the secrets of her laboratory undisclosed. Many and many of the most important details of her wonderful processes of composition and decomposition and of the vast play of her chemical affinities, yet await the persevering investigation and penetrating thought of man. I will endeavor to lay before you, succinctly, what is known or rationally conjectured in regard to the operations and effects of lime, so far as may be material to the present purpose.

It is applied to land, either directly or mixed, in compost heaps, and carried out in manure.—But for the additional labor the latter would always be the best method. Where it is used in large quantities, it is much cheaper to spread it at once upon the land, and apply manure, &c. afterward, as circumstances may dictate or permit. It is sometimes put on land in the state in which it comes from the kiln, that is, as quick or caustic lime. Sometimes it is first slaked in water, when it becomes a hydrate of lime. Most commonly it is slaked by mere exposure to the atmosphere, when it assumes the form of carbonate or mild lime, that is, lime combined with carbonic acid, which it extracts from the air in the proportions I have already stated. It is in this form that it is found most abundantly in nature. Sulphate and phosphate of lime are also found, but quick-lime never. The lime in shells, marble, limestone, marl, &c. is usually all of it the carbonate. Its action, however, in the long run, is always the same, whether applied in the mild or caustic state, being dependent on its intrinsic properties as lime. When caustic, it at first rapidly decomposes whatever of vegetable fibre or animal matter it comes in contact with. But its caustic quality is soon exhausted, or rather it soon becomes changed itself by the action of the substances it meets with, and thus loses its causticity. On lands containing a great excess of vegetable matter, such as peat and rich bog, and where rapid decomposition is desirable, quick-lime is the best form of application, if equally cheap, as it saves time, and renders the soil productive much sooner than the carbonate will do it.

Although lime is found most commonly combined with carbonic acid, the fact is owing more to the abundance of that acid which exists in the atmosphere, in water, and is continually rising from vegetable decay, than because it has any affinity for carbonic over other acids. On the contrary, it will yield it up and combine in preference with almost any other. Not only the strong mineral, but most vegetable acids, even vinegar, as I have before mentioned, will drive it off. The effervescence which takes place when carbonate of lime is thrown into them, is caused by the carb. acid escaping in the form of gas. From this great affinity of lime for all acids results one of its primary and most important effects in soils. Acids are anti-septic and arrest spontaneous decay. Lime combines with them wherever it finds them free from other combinations, and neutralizes their injurious effect. Hence, on lands that we call sour—and on many that are really sour without our knowledge of the fact—all land covered with broom-sedge, for example—it is of inestimable value.—It destroys the sourness, and thereby promotes the decay of whatever matter may have been locked up by acids, which is calculated to nourish useful vegetation. From this quality of lime, it is denominated an Alkaline Earth—alkali being the reverse and antagonist of acid. Whenever an alkali and acid meet, they neutralize one another in certain proportions, and form what is called a salt. For instance, our common salt is muriatic acid, and the alkali soda. So carbonate of lime is, in fact, itself a salt.

These salts, and especially those of which lime is a component part, are of the highest value in Agriculture. Some of them are soluble in water, and these are the most valuable. It is, in fact, only when they are thus dissolved that they afford any direct nourishment to growing plants, which can imbibe nothing by their roots but watery solutions, and are fed altogether in this way from the ground. But the salts which are readily soluble in water are soon exhausted. Every shower dissolves them, and whatever surplus is left after the plants have absorbed the solution to the extent of their capacity, is liable to escape by evaporation, or to be carried by the water into the earth below the reach of vegetation, or to run off with it into the streams. Salts, then, that are not immediately soluble in water, if they can be made soluble gradually, are in the long run the most useful to the farmer. Of this class are most, if not all, of the salts formed by lime. Carbonate of lime is indeed wholly insoluble in pure water, and if lime remained forever in that state it would be of little value in the soil other than its mechanical influence on the texture of it.—But if carbonic acid be added in excess—that is, more of it than 44 parts in one hundred, which are required to make the carbonate, this salt becomes soluble. This excess is in point of fact constantly furnished in small quantities by the air, by rain water, and by the decay of vegetable substances in the ground, and hence, one advantage from keeping lime near the surface.—The lime thus dissolved enters into the plant and feeds it. In this way, and this way only, is it a

direct manure. All its other influences are indirect, on which account it is most generally regarded as a stimulant rather than a manure. I am speaking, of course, of carb. of lime as it exists in our marls, and not the sulphate or phosphate of lime.

Its indirect action, however, is as important as it is varied. I have already said it promotes decay by neutralizing acids. But while lime from its neutralizing power promotes decay, by arresting the influence of acids and giving efficiency to the legitimate agents which accomplish it, it is a watchful guardian over their action, retarding their wasteful haste, and sometimes wholly preventing farther progress for a time.—It expels, for instance, from decomposing substances, ammonia, which is the most active and rapid conductor of putrefying contagion, driving it into the air to descend in future showers, or, if they are at hand, into other substances less advanced in the stages of decay.

The ultimate result of the vegetable decomposition thus judiciously forwarded by lime, is a substance to which various names have been applied by chemists, such as "*humus*," "*geine*," "*ulmin*," &c., which, so far as Agriculture is concerned,—their treatment and influence on the growth of vegetation, are one and the same thing; meaning, substantially, that residuum of decomposition which is familiarly known to us as "*vegetable mould*," without a sufficiency of which, in our soils, we are all aware that compensating crops cannot be made. In the progress of decay the most soluble portions of this mould are exhausted and assume new forms, and what at last remains apparently fixed in the soil is the undissolved sediment. This is said to be wholly insoluble in water, but when plowed up and frequently exposed to the action of the air, it becomes so, sparingly. Yet, without aid from some other source than the atmosphere, water will not furnish it to plants in sufficient quantities for their vigorous growth. Now the alkalies and alkaline earths (lime being the most important of this last class) act directly on this insoluble substance. Their presence—and it is a singular but well known principle in Chemistry, that *mere presence is a power* called catalytic—induces it to absorb oxygen from the atmosphere, and to produce what is called humic acid. With these acids the alkalies immediately combine and form salts called humates, which are soluble in water, and afford nourishment to plants.—Thus when lime is properly applied to land, it brings into fruitful action the hitherto inert vegetable mould.

But it must be obvious that if no additional vegetable matter is given to the soil, the effect of lime will be to exhaust it utterly, in a shorter time than might otherwise be done by cropping. Hence the saying that liming land enriches the father but impoverishes the son. It must not be forgotten, however, that the lime has enriched the father, by giving abundantly to his crops food that would otherwise have remained dead in his soil, or been eliminated by other agents, through a series of years, in feeble proportions, to scant, and therefore profitless crops; while, if it impoverishes the son, it is because a wretched husbandry has taken all from the land, and given nothing in return. The exhausting effect of lime is mitigated, however, by another highly important intermediate condition of the process. As the mould disappears, the proportion of lime to mould of course increases, and the lime becomes excessive. When this is the case, the humate, which before was soluble, becomes wholly insoluble in water. The process of decomposition then ceases for a time. And such is the case very soon, wherever lime or marl, in very large doses, is put on land possessing but little vegetable matter. It is called "marl burnt," among the marlers—many instances of which I can point out on my plantation. In course of cultivation, however, the lime being constantly exposed to the atmosphere, absorbs carbonic acid, which, combining with a portion of it, converts it into carbonate of lime again, and thus freeing the humate, or a part of it, of the excess of lime, renders it soluble once more. But this is a very slow process, and unless there are immense quantities of vegetable mould which have been thus locked up by an extraordinary and injudicious application of lime, and probably even then, the proper plan is to remedy the evil at once, by a heavy coating of vegetable matter brought fresh from the woods.—When this cannot be effected, we should give the land a long and absolute rest, allowing every particle of vegetation it produces to rot upon it, and if it can be conveniently done, to plow it in. The best of all methods, however, to restore the land, and not always the most expensive, would be to add a sufficiency of compost manure. Besides the amount of decayed vegetation which such manure would supply, the alkalies potash and soda are always generated in compost heaps. These act directly on the insoluble humate of lime, decompose it by their greater affinity for the humic acid, and form new salts which are quite soluble.

Instead of objecting to this action of lime in locking up the food of plants, and its constant tendency to do so when that food is not made abundant by good husbandry, we should rather regard it as one of its most valuable properties. The vegetable mould was dead in the soil. It could not be carried away, but it was of little value as it stood. The lime by its presence persuades it to decompose in sufficient quantities to nourish a luxurious growth of plants. So soon as the mould begins to become scarce, the lime confines it in its embraces and preserves it from the wasteful influence of heat and moisture. Yet, to the industrious farmer whose constant furrows give access to the atmosphere, it yields up what a prudent economy would dictate, under existing circumstances, to promote the growth of vegetation. If that vegetation is permitted to remain and decompose upon the land, "vegetable mould," in time, becomes abundant again, and the lime prepares it to furnish ample food for heavy crops once more. If all the produce is taken off, the lime, more provident than the farmer, and more generous too, still preserves what remains in the soil, for the exclusive use of the crop, and doles it out until all is gone.

The influence of lime upon the mineral substances of the earth is scarcely less powerful and important to the farmer than on the vegetable. The chief mineral constituents of the soil are, as you know, sand and clay. They are usually resolved by agricultural chemists into what they call silica and alumina, which are silicon and aluminum, their ultimate principles, with a little oxygen absorbed from the atmosphere. Of these two, silica is much the most abundant, as well, perhaps, as most valuable.—After what we call clay has been deprived of its sand by washing, in which state it is usually denominated pure or agricultural clay, it still

holds in chemical combination from 50 to 60 per cent. of silica. The purest pipe clay we find is half silica; and the stiffest red lands of your County probably contain at least 70 per cent. of it, and not more than 15 per cent. of alumina.—Lime and alumina have a strong affinity, and from their combination and subsequent decomposition results the important and well-established fact that the stiffest clay lands are rendered light and mellow by liming. The rationale of this process has never been satisfactorily explained. The effect is usually referred to the mere mechanical operation of the lime. But this cannot be so, since a hundred, or at most a few hundreds of bushels per acre of one earth could not materially alter the texture of another, to any depth. It is probable that the crumbling of the clay, after liming, will be found to be owing to the condensation, by severe cold, of the carbonic acid supplied by the lime, and its extraordinary power of expansion under the influence of returning heat, since this disinteration of stiff lands has never been observed until a winter has elapsed after the application of lime or marl. Alumina will not combine with carbonic acid; and it may be that clay lands are opened partly by the incessant changes occasioned by the affinity of lime for both. Being insoluble in water, alumina furnishes of itself little or no aliment to the growing plant, though it has other indirect influences fully in proportion to its conspicuous position as a constituent of soils.

Silica, on the contrary, enters largely into the formation of the plant. It has, as I have mentioned, acid properties, and combines with the alkalies and alkaline earths and metals, forming salts of the greatest value in numerous points of view, which are called silicates. It is the silicate of potash, sometimes replaced by that of soda, and to some extent by that of lime, which forms the outer coating of straw, stems, stalks, &c. giving both strength and protection to the plant. These silicates are insoluble in water—so much so that they constitute the chief ingredient of rocks. But that universal and inexhaustible agent, the carbonic acid of the atmosphere, acting on the alkaline bases of the silicates, decomposes them; hence the gradual breaking down of rocks under atmospheric influence.

[*To be concluded in the June No.*]

PRICES CURRENT.

[*Corrected, April 22, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort	℔ 100 lb.	3 87½	@— —
Pearls, 1st sort, '45		4 18¾	@— —
BEESWAX—American Yellow		— 29½	@— 30
CANDLES—Mould, Tallow	℔ lb.	— 9	@— 11
Sperm, Eastern and City		— 26	@— 38
COTTON—From	℔ lb.	— 6¾	@— 10
COTTON BAGGING—American		— 12	@— 13
CORDAGE—American	℔ lb.	— 11	@— 12
DOMESTIC GOODS—Shirtings,	℔ y.	— 5½	@— 11
Sheetings		— 7	@— 15
FEATHERS—American, live		— 26	@— 31
FLAX—American		— 7½	@— 7¾
FLOUR & MEAL—Genesee,	℔ bbl.	5 37½	@— —
Troy		5 31½	@ 5 37½
Michigan		5 31½	@— —
Ohio, flat hoop		5 31½	@— —
Ohio, Heywood & Venice		6 12½	@ 6 25
Ohio, via New-Orleans		5 —	@ 5 12½
Pennsylvania		— —	@— —
Brandywine		5 37½	@— —
Georgetown		5 12½	@— —
Baltimore City Mills		5 12½	@— —
Richmond City Mills		6 25	@ 6 50
Richmond Country		5 12½	@ 5 25
Alexandria, Petersburg, &c.		5 —	@ 5 12½
Rye Flour		3 25	@ 3 37½
Corn Meal, Jersey and Brand		3 25	@ 3 37½
Corn Meal, Brandywine	hhd.	15 75	@16 —
GRAIN—Wheat, Western	℔ bush.	1 18	@ 1 25
Wheat, Southern	new	1 10	@ 1 15
Rye, Northern		— 73	@— 74
Corn, Jersey and North	(meas.)	— 67	@— 68
Corn, Southern	(measure)	— 67	@— —
Corn, Southern	(weight)	— 67	@— 68
Oats, Northern		— 43	@— 45
Oats, Southern		— 37½	@— 40
HAY—North River	bales	— 65	@— 80
HEMP—American, dew-rotted	ton	70 —	@ 90 —
" " water-rotted		120 —	@170 —
HOPS—1st sort, 1845		— 20	@— 26
IRON—American Pig, No. 1		35 —	@37 —
" Common		25 —	@30 —
LIME—Thomaston	℔ bbl.	— 90	@— —
LUMBER—Boards, N.R.,	℔ M. ft. clr.	35 —	@40 —
Boards, Eastern Pine		11 —	@13 —
Boards, Albany Pine	℔ pce.	— 10	@— 19
Plank, Georgia Pine	℔ M. ft.	32 50	@35 —
Staves, White Oak, pipe,	℔ M.	50 —	@— —
Staves, White Oak, hhd		40 —	@— —
Staves, White Oak, bbl		31 —	@— —
Staves, Red Oak, hhd		27 —	@30 —
Hoops		25 —	@30 —
Scantling, Pine, Eastern		— —	@16 25
Scantling, Oak		30 —	@35 —
Timber, Oak	℔ cubic foot	— 25	@— 37
Timber, White Pine		— 18	@— 25
Timber, Georgia Yellow Pine		— 20	@— 25
Shingles, 18 in	℔ bunch	1 75	@ 2 —
Shingles, Cedar, 3 feet, 1st quality		— —	@24 —
Shingles, Cedar, 3 feet, 2d quality		22 —	@23 —
Shingles, Cedar, 2 feet, 1st quality		19 —	@— —
Shingles, Cedar, 2 feet, 2d quality		16 —	@18 —
Shingles, Cypress, 2 feet		13 —	@14 —
Shingles, Company		— —	@29 —
MUSTARD—American		— 16	@— 31
NAILS—Wrought, 6d to 20d	℔ lb.	— 10	@— 12½
Cut 4d to 40d		— 4	@— 4½
PLASTER PARIS—℔ ton		2 87½	@ 3 —
PROVISIONS—Beef, Mess,	℔ bbl.	7 50	@ 8 50
Beef, Prime,		5 25	@ 5 50
Pork, Mess, Ohio		10 50	@10 87½
Pork, Prime, Ohio		9 44	@ 9 50
Lard, Ohio	℔ lb.	— 6¾	@— 7½
Hams, Pickled		— 5	@— 5½
Shoulders, Pickled		— 4	@— 4½
Sides, Pickled		— —	@— —
Beef, Smoked	℔ lb.	— 6½	@— —
Butter, Orange County		— 14	@— 16
Butter, Western Dairy		— 11	@— 14
Butter, ordinary		— 9	@— 11
Cheese, in casks and boxes		— 7	@— 8
SEEDS—Clover	℔ lb.	— 6½	@— 7½
Timothy	℔ tierce	11 —	@16 —
Flax, Rough		9 —	@— —
SOAP—N. York, Brown	℔ lb.	— 4	@— 6
TALLOW—American, Rendered		— 7	@— 7⅝
TOBACCO—Virginia	@ lb.	— 3	@— 6
North Carolina		— 3	@— 5
Kentucky and Missouri		— 3	@— 7
WOOL—Am. Saxony, Fleece,	℔ lb.	— 38	@— 40
American Full Blood Merino		— 36	@— 38
American ½ and ¾ Merino		— 30	@— 33
American Native and ¼ Merino		— 26	@— 28
Superfine, Pulled		— 28	@— 30

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BRIEF SKETCH OF THE LIFE AND WRITINGS OF JOHN CLAUDIUS LOUDON.

In giving a Portrait, with some particulars of the life and writings, of the late John Claudius Loudon—taken from the Journal of the Highland Agricultural Society—we are aware that we lay ourselves liable to the imputation of giving too much of foreign impress and character to a work designed for American agriculturists. But, again, we take justification and comfort in the belief that every reader of reflection will say to himself, "What care I to what country the subject of a memoir belongs, if the man whose worth it commemorates was highly distinguished for useful talents and such exemplary virtues as every gentleman who lives in the country and gives his time to its pleasures and pursuits, should aim to possess for himself and to cultivate in his sons? Give me, says such a reader, for the emulation and benefit of the rising generation, the particulars of the lives and fortunes, not of your successful political partisans and heroes, great or small, but of that more truly noble and useful order of men, of whatever clime or country, who, like Loudon, have evinced, even in the dawn of their career, an auspicious fondness for the arts of cultivating the earth, and a taste for its floral and horticultural embellishment; and whose maturer labors in the closet and the field have all tended to enlighten the practice and multiply the fruits of peaceful industry!

In treating of Experimental Agriculture, and in recommending particular staples, implements or processes, every man of common sense knows that the Editor of a journal dedicated to these purposes, must have regard to *circumstances*. It needs no ghost from the grave to tell us that, in drawing upon English, or French, or German, or other foreign works, for discoveries that may be useful in the practice of American husbandry, constant reference must be had to difference in the climate, in the price of labor, in the condition of the landholder, in the habits of the people, and the tastes and means of the consumers. Thus, for example, every one knows, as to climate, that ours is not adapted to a profitable culture of the pine-apple, or the banana—and hence we do not draw upon English horticultural works that abound in dissertations on the growth of "pines," as they call them; yet *there* such dissertations are not out of place, because there reference is had again to the condition and means of an opulent aristocracy, who, while thousands of their countrymen languish and perish for want of their "daily bread," which neither labor nor prayers in or out of church can procure, load their own tables with exotics, the pampered and luxurious fruits of an artificial climate. Even the turnip of England, in that country the subject of so much labor and the theme of so much disquisition—which is said even to constitute their meat and their manure—attracts less and would less reward attention in this country, because we are deficient in the moisture that is indispensable to the uniform production of heavy and remunerating crops.—All this, we repeat, every tyro must know; and, in the conduct of the journal committed to our care, we have failed not, and shall not fail, to bear these obvious considerations in mind. But does it follow that we should read with less interest, or exhibit the less earnestly, the lives of such men as Loudon, whose thoughts and labors were employed in a manner to diffuse throughout the world a knowledge of the prin-

ciples of culture, and of a refined taste in rural architecture and plantations of trees and flowers? As to this feature in the plan of the FARMERS' LIBRARY, it has always commended itself in an especial manner to our esteem, by the hope which it holds out that in this way we may stimulate our young farmers, who are coming on, to emulate the knowledge and the diligence of those whose lives are thus commemorated; and hence we here announce with the greater pleasure that, with a liberality well befitting the inheritor of his partialities, his fortune and his virtues, the son of the late JAMES WADSWORTH has caused to be supplied, for the FARMERS' LIBRARY, a well executed portrait of his father, from the easel and the graver of two of the most eminent artists of the day.—This we shall give in the July Number, there to await the coming memoir, if we should not have the good fortune to receive that in time to accompany the likeness.

We had hoped that such likenesses and memoirs would adorn our pages at least every alternate month, but, strange to say, of such quiet and useful citizens few portraits are to be found; and their descendants seem to be too insensible to the importance of holding them up as shining lights to the rising generation, and to the obligation which devolves on them, to aid us in doing it—so that it may happen that

"*Even in their ashes shall live their wonted fires.*"

We have been encouraged to hope that we shall be enabled to preserve memorials, in this way, of two eminent agriculturists of the South—one an early and powerful writer on Southern Agriculture; the other a well known, bold and enterprising pioneer in the cultivation of the two great staples that constitute so large a portion of our national wealth—but there has been so much backwardness—we have been so much disappointed already on this point—that we are chary of making promises for the future; avowing here, once for all, the readiness of the Editor and the liberality of the Publishers to do their part.

Were they military heroes, instead of peaceful cultivators of wool and bread "to feed the hungry and to clothe the naked," we should have no difficulty. Governments and City Corporations would eagerly ask, "*Will you do us the honor to sit for your likeness?*" But what Society or Public Authority seeks to procure and display in its halls the likenesses of such men as PICKERING and LOWELL, of Mass.; and Chancellor LIVINGSTON, and BUEL, of New-York; and SINGLETON, and LLOYD, and MOORE, of Maryland; and TAYLOR and GARNETT, of Virginia; and PINKNEY and HAMPTON, of South Carolina? Ay! as if to quicken the spirit of this inquiry, at the very moment of writing thus far, and pausing to open a letter from Utica—a gentleman there, in perfect sympathy with our own feelings, referring to the scheme of a great Library at Washington as the prominent feature of the bill to establish the Smithsonian Institution, despondingly remarks: "For one I have almost despaired of ever seeing our Government, which is said to be based upon the intelligence of the People, do anything of moment for promoting, in an efficient way, a knowledge of those pursuits which tend to *Virtue* and *Peace*. Army and Navy! Texas and Oregon! cannon and muskets! shooting deserters! &c. God have mercy upon us!"—And so we say, amen!

If, however, while we thus profess, and offer to give, decided preference to those whose memoirs would illustrate the agricultural annals of our own country, there be any who would insinuate that, in holding up as models to young Americans the lives and labors of foreigners, which we find prepared to our hand in the transactions of enlightened and public spirited European Societies, we are betraying an anti-American spirit, or fostering a sentiment of homage to men or to things foreign, because they are foreign, we shall only say that we hold all such suspicions in contempt, and repose confidently on the good sense of more liberal and judicious readers. As Editor and as individual we hold all countries to be alike—enemies in war; in peace, friends—except that we pretend not to be above that natural, not to say filial, impulse which leads every one, we suppose, to refer with peculiar pleasure, when it can be done with justice, to the country of his ancestors for examples of all that is most worthy of imitation and rivalry in arts that most contribute to rural embellishment and felicity—arts by which such men as REPTON, and LOUDON, and AUDUBON, and DOWNING, have contrived to open some fountains and to plant some green spots along the dreary journey of life.

In this case, we should think the space allotted to these extracts from the life of LOUDON well appropriated, did it serve only to exemplify the conjugal devotion of the author, and the share, however humble, which she faithfully performed in the preparation of works which have done so much to open the mind and the heart of the world to the true principles of taste and the countless beauties of Nature.

To the last moment she stood by the husband whom she had taken "for better, for worse," as well in sickness as in health—assisting him, night and day, in his Herculean labors, until that awful crisis for a wife, when, to use her own words, "I had just time to clasp my arms around him, to save him from falling, when his head sank upon my shoulder, and he was no more."

Supposing, then, the subject and the details to be appropriate, who would think of asking, with any view of detraction from their merits, to what country did such fellow laborers in the great vineyard of public usefulness belong?

JOHN CLAUDIUS LOUDON was born at Cambuslang, in Lanarkshire, on the 8th April, 1783. His father was a farmer, and resided, at the time the subject of this notice was born, at Kerse Hall, near Gogar, in the vicinity of Edinburgh. Young Loudon showed an inclination for gardening when very young, and his greatest pleasure, during his early boyhood, was in making walks and beds, and rearing plants in his father's garden. Anxious to obtain for him the advantages of a liberal education, his father sent him to Edinburgh for the purpose of attending the public schools. Here he acquired some knowledge of classical learning, for which he had shown a strong repugnance, and made himself acquainted with French and Italian. Drawing was at this period his favorite pursuit, and in this he made such proficiency that he was qualified at an early age to become draughtsman and assistant to Mr. John Mawer, at East Dalry, near Edinburgh. He subsequently resided for several years with Mr. Dickson, nurseryman in Leith Walk, and during that time he attended classes on Botany, Chemistry, and Agriculture, in the Edinburgh University. He was noticed at this time for the diligence with which he prosecuted every branch of study on which he entered. Such was his desire of improvement that he regularly sat up two nights every week to study, drinking strong green tea to keep himself awake. This practice he continued for many years.

He repaired to London in 1803, and began to occupy himself professionally as a landscape gardener. In this he was eminently successful, finding abundance of employment in many different parts of England. Through the influence, probably, of Sir Joseph Banks, who always continued to be his warm friend, at whose house he occasionally met most of the scientific men of the day, he was early elected a member of the Linnean Society. Mr. London's first work appears to have been suggested to him while employed in Scotland, in 1804, laying out grounds for various noblemen and gentlemen—in particular, the Earl of Mansfield, who was then altering and improving the palace gardens at Scone. The book alluded to was entitled—"Observations on the Formation and Management of Useful and Ornamental Plantations, on the Theory and Practice of Landscape Gardening, and on Gaining and Embanking Land from Rivers or the Sea." This work was published in Edinburgh by Constable & Co., and by Longman & Co. London, with the latter of whom Mr. Loudon continued to transact business of this kind for nearly forty years. This was succeeded, in 1805, by another publication, entitled—"A Short Treatise on some Improvements lately made in Hot-houses." A more important work than either of these appeared on the following year, ornamented by some elegant copper-plate engravings of landscape scenery.—This was his "Treatise on Forming, Improving and Managing Country Residences, and on the Choice of Situations appropriate to every class of Purchasers, &c."

The year 1806 was marked by an occurrence which proved a source of great annoyance to Mr. Loudon, not only at the time it happened, but during the whole of the remainder of his life. While traveling in Wales, he caught a violent cold by being exposed all night on the top of a coach to the rain; this brought on rheumatic fever, which finally settled in his left knee, and, from improper medical treatment, terminated in a stiff joint. While suffering under the immediate effects of this calamity, which befell him in the prime of his days and the vigor of his power, his mental energy continued unabated; he painted landscapes, learned German—paying his expenses, as he had done before when he learned French, by selling for publication a pamphlet he had translated by way of exercise; he also took lessons in Greek and Hebrew. A farm called Wood-Hall, where he stayed during his illness, being to let, he induced his father to rent it, with a view of improving the state of husbandry, which was then in a wretched state in many parts of England. The attention he was thus led to pay to Agriculture was the means of inducing him to embody his opinions on this subject in a pamphlet published in 1808, entitled—"An Immediate and Effectual Mode of Raising the Rental of the Landed Property of England, and rendering Great Britain Independent of other Nations for a Supply of Bread-corn." He afterward took another farm, called Great Tew, not far from Oxford, where he established a kind of agricultural college for the instruction of young men in agricultural pursuits, being desirous of securing a permanent source of income, in case his anchylosed knee should prevent him carrying on his favorite pursuit of landscape gardening. In 1809 he published a pamphlet, giving an account of this institution, and pointing out the utility of agricultural knowledge to the sons of the landed proprietors of England, and to young men intended for estate agents.

By the exercise of his profession as a landscape gardener, diligently prosecuted, not only in England and Scotland, but also in Wales and Ireland, Mr. Loudon had amassed a considerable sum of money—upward of £15,000; and when the Continent was thrown open to English visitors, by the general rising against Bonaparte in 1803, he resolved to relax his exertions for a time, and gratify his ardent thirst for knowledge by traveling abroad. He accordingly repaired to Sweden, Prussia, Austria, and Russia; visited the two capitals of the latter country—arriving at Moscow on the 4th of March, 1814, while the buildings were yet black with the famous conflagration. Of the various difficulties he encountered on the road, we may mention the following:

"Once the horses in his carriage, being unable to drag it through the snow-drift, the postillions very coolly unharnessed them and trotted off, telling him that they would bring fresh horses in the morning, and that he would be in no danger from the wolves, if he would keep the windows of the carriage close, and the leathern curtains down. There was no remedy but to submit; and few men were better fitted by Nature for bearing the horrors of such a night than Mr. Loudon, from his natural calmness and patient endurance of difficulties. He often, however, spoke of the situation he was in, particularly when he heard the howling of the wolves, and once when a herd of them rushed across the road close to his carriage. He had also some doubts whether the postillions would be able to recollect where they had left the carriage, as

the wind had been very high during the night, and had blown the snow through the crevices in the curtains. The morning, however, brought the postillions with fresh horses, and the remainder of the journey was passed without any difficulty."—p. 23.

After his return from the Continent, he unfortunately embarked in mercantile speculations, and underwriting ships at Lloyd's, by which he lost nearly the whole of the money he had accumulated by his professional labors. About this time his health began to be seriously impaired, and he took a house at Bayswater, called the Hermitage, with a large garden annexed, which continued to be his residence till his death. He now seems to have devoted his time chiefly to his pen. He projected his "Encyclopedia of Gardening," and, in order to collect materials, visited France and Italy, although his health was at this time in a very precarious state. This well known work appeared in 1822; it had an extraordinary sale, and fully established the literary fame of its author. In 1825, the "Encyclopedia of Agriculture" was written and published. The preparation of these laborious works in such rapid succession (for a second edition of the "Encyclopedia of Gardening," almost wholly re-written, appeared in 1824), speak strongly to the indomitable energy of his mind; for his bodily health was at this time in a lamentable state. His right arm had been broken a second time, and he suffered so severely from the pain, that he found no ease but from the use of laudanum, to which he became at last so habituated, that he took *a wine glassful every eight hours.* After the amputation of his arm, however, he speedily cured himself of this dangerous habit without experiencing any inconvenience.

The "Gardener's Magazine," a work with which his name is more particularly associated in the minds of the practical gardeners of this country, was established in 1826. This was his favorite work, the organ through which he communicated his own thoughts and feelings to the public. It met with a most favorable reception, 4,000 copies of the first number having been sold in a few days, and it continued to enjoy a high degree of popularity till its close at the death of the conductor. Two years afterward he began the "Magazine of Natural History," the first work of the kind, we believe, ever published in this country. It also was favorably received, and had a considerable sale.

The writer of the memoir from which these memoirs are extracted, describes the occasion of her first introduction to Mr. Loudon. This she must be permitted to do in her own words:

"My father died in 1824, and finding, on the winding up of his affairs, that it would be necessary for me to do something for my support, I had written a strange and wild novel called "The Mummy," in which I had laid the scene in the twenty-second century, and attempted to predict the state of improvement to which this country might arrive. Mr. Loudon chanced to see the review of this work in the *Literary Gazette*, and as, among other things, I had mentioned a steam-plow, it attracted his attention, and he procured the work from a circulating library. He read it, and was so much pleased with it, that he published, in the Gardener's Magazine for 1828, a notice of it under the head of "Hints for Improvement;" and he had from that time a great desire to become acquainted with the author, whom he supposed to be a man. In February, 1830, Mr. Loudon chanced to mention this wish to a lady, a friend of his, who happened to be acquainted with me, and who immediately invited him to a party, where she promised him he should have the wished-for introduction. It may be easily supposed that he was surprised to find the author of the work a woman; but I believe from that evening he formed an attachment to me, and, in fact, we were married on the 14th of the following September."—p. 35.

But our space will not permit us to enter much farther into details, nor even to indicate all the works which he laid before the public. In 1832 he commenced his "Encyclopedia of Cottage, Farm and Villa Architecture"—one of the most useful of all his productions. In the preparation of this work his wife acted as his sole amanuensis; and for several months he and she used to sit up the greater part of every night, never having more than four hours' sleep, and drinking strong coffee to keep themselves awake. This work was published on the author's own account; and the great success that attended it tempted him to publish the "Arboretum Britannicum" in the same manner. This latter undertaking gradually expanded under his hands, and it was his determination to make it as perfect as possible that involved him in the pecuniary difficulties which, to all appearance, hastened his death. As all the drawings of trees for the "Arboretum" were made from Nature, he had seven artists constantly employed, and he was frequently in the open air with them from his breakfast at seven in the morning, till he came home to dinner at eight in the evening, having remained the whole of that time without taking any refreshment, and generally without even sitting down. After dinner he resumed the literary part of the work, and continued writing, along with his wife as his amanuensis, till two or three o'clock in the morning. He had three other monthly works besides the "Arboretum" going on at the same time. During this period of extraordinary exertion, both of mind and body, he was suffering under what was supposed to be a liver complaint, and an enormous swelling in his right knee. When the "Arboretum" was completed, he found that he owed *ten thousand pounds* to the printer, stationer, and wood-engraver, who had been employed in the undertaking. The work, along with "Cottage Architecture," was placed in the hands of Messrs. Longman & Co., to hold for the creditors till the debt should be paid by the sale.

Subseqently to this period, Mr. Loudon visited France and Scotland. While in the latter country he was seized with a severe bilious fever.—On his recovery he visited various places in the southern division of the country, carefully examining the principal gardens, and making notes of all he saw. On his return to England, the first number of the "Encyclopedia of Trees and Shrubs" made its appearance; and, in 1843, his work on "Cemeteries," on which he bestowed much pains, and which was very expensive, owing to the number of engravings. Mr. Loudon had an attack of inflammation in the lungs on two different occasions. In 1843 his lungs again became diseased, and that so seriously, that he appears by the end of September in that year to have lost hope of ultimate recovery. Even in these circumstances he labored almost night and day to finish the works he had on hand; and that, too, notwithstanding the agitation attendant on the numerous letters and consultations

respecting his pecuniary affairs. On the 13th of December

"He appeared very ill," (says his widow), "and told me he thought he should never live to finish 'Self Instruction,' but that he would ask his friend Dr. Jamieson, to whom he had previously spoken on the subject, to finish the work for him. Soon after this he became very restless, and walked several times from the drawing-room to his bedroom and back again. I feel that I cannot continue the melancholy details; it is sufficient to say that, though his body became weaker every moment, his mind retained all its vigor to the last, and that he died standing on his feet. Fortunately, I perceived a change taking place in his countenance, and I had just time to clasp my arms round him, to save him from falling, when his head sank upon my shoulder and he was no more.

"I do not attempt to give any description of the talents or character of my late husband as an author; his works are before the world, and by them he will be judged; but I trust I may be excused for adding, that in his private capacity he was equally estimable as a husband and a father, and as a master and a friend. He was also a most dutiful son and most affectionate brother.

"It was on the anniversary of the death of Washington (the 14th of December) that Mr. Loudon died, and he was buried, on the 21st of December, in the cemetery at Kensall Green. When the coffin was lowered into the grave, a stranger stepped forward from the crowd and threw in a few strips of ivy. This person, I was afterward informed, was an artificial flower maker, who felt grateful to Mr. Loudon for having given him, though a stranger, tickets for admission to the Horticultural Gardens, and who, having never been able to thank Mr. Loudon in person, took this means of paying a tribute to his memory.

What remains is taken from some anecdotes of Mr. Loudon, communicated for an English paper, by a young man who had lived with him many years as draughtsman. After giving instances to show his strict love of truth and his personal determination, he adds, as to his love of *order*—which we the rather publish from always having felt the want of it:

"His love of order was also very great. The books in the library, and manuscripts in his study were so arranged that he could at any time put his hand upon any book or paper that he might want, even in the dark. He instilled this system of order into the minds of his clerks too; for, when any new one came, his invariable instructions were—'Put everything away before you leave at night, as if you never intended to return.'

"He was also a man of great punctuality as to time, money matters, and in every other respect. When any of his clerks happened to be behind time in the morning, he would take no notice for a few times; but, if it were often repeated, he would say very quietly but sarcastically—'Oh, if 9 o'clock is too early for you, you had better come at 11 or 12; but let there just be a fixed hour, that I may depend upon you.'

"Mr. Loudon was a man of great fortitude and unwearied industry. The morning that Doctors Thompson and Lauder called upon him for the purpose of amputating his right arm, they met him in the garden, and asked if he had fully made up his mind to undergo the operation. 'Oh, yes, certainly,' he said; 'it was for that purpose I sent for you;' and added very coolly, 'but you had better step in, and just have a little lunch first before you begin.' After lunch he walked up stairs quite composedly, talking to the doctors on general subjects. When all the ligatures were tied, and everything complete, he was about to step down stairs, as a matter of course, to go on with his business; and the doctors had great difficulty to prevail upon him to go to bed.

"As a man of industry, he was not surpassed by any one. Deducting for the time he has been poorly, he has, during three fourths of his literary career, dictated about five and a half printed octavo pages of matter every day on an average. He has been frequently known to dictate to two amanuenses at the same time. He often used to work until 11 and 12 o'clock at night, and sometimes all night. It may not be amiss to mention here, as illustrative of his love of labor, that, while his man-servant was dressing him for church on the day of his marriage, he was actually dictating to his amanuensis the whole time.

"Although Mr. Loudon was a matter-of-fact man, he had nevertheless a good deal of poetry in his soul. The writer happened to dine with him the day that he attended Dr. Southwood Smith's Anatomical Lecture on the body of his friend Jeremy Bentham. Just at the moment the lecturer withdrew the covering from the face of the corpse, the lightning flashed, and an awful burst of thunder pealed forth—

'Crush'd horrible, convulsing heaven and earth!'

Mr. Loudon, during dinner, gave a most touching, poetical, and graphic description of the lecture, and the circumstances attending it; and every one present could see how deeply he felt the loss of his friend Bentham.

"Mr. Loudon was a man, like most good men, rather easily imposed upon. He, contrary to the ways of the world, looked upon every man as a good man until he had proved him otherwise; but when he had done so, he was firm in his purpose. He was a warm friend, an excellent husband, an amiable brother, and a most affectionate and dutiful son. Altogether

'He was a man, take him for all in all,
We shall not look upon his like again.'

—

"ELEGY.

"HARK! hark! the sound—'tis a funeral knell
Borne on the breath of day—
The mournful voice of the deep-toned bell—
For a spirit has winged his way.

'Tis not the man of wealth and state
That the world has now to mourn;
'Tis not the man that gold makes great
Who now to the tomb is borne.

No! no! we grieve in the friend now gone,
No flattering slave of state;
But the world has lost by the death of one
Whose mind was truly great.

He wielded no sword in his country's cause,
But his pen was never still;
He studied each form of Nature's laws,
To lessen each human ill.

That voice is hushed!—and lost the sound
Employed to raise the poor;
But the echo shall, by his works, be found
To reach the rich man's door.

He wakes no more!—for the sleep of death
Encircles the earthly frame;
But the mind—so strong while it dwelt on earth—
Secured a living fame.

His pen is still!—and his spirit fled
To brighten a world on high:
The cold, cold earth is his lowly bed;
But his *name* shall never die!

Chatsworth. J. R."

THE SMITHSONIAN INSTITUTION;

THE INTERESTS AND RIGHTS OF AGRICULTURE NEGLECTED—AS USUAL.

UTICA, N. Y. May 11, 1846.

DEAR SIR: In the March number of the FARMERS' LIBRARY you made a few remarks upon the proposed "Smithsonian Institution," which I heartily approve of. Having taken a deep interest in this matter, I addressed to Hon. ROBERT DALE OWEN, the Chairman of the Select Committee of the House of Representatives, a letter, of which the accompanying is a copy. It proposes a plan somewhat different from any that I am aware of. I send it to you merely for your perusal, and not for publication, unless you deem it worthy, which I do not. For one, I have almost despaired of ever seeing our Government—which is said to be based upon the intelligence of the people—do any thing of moment for promoting in an efficient way a knowledge of those pursuits which tend to virtue and peace. Army and Navy—Texas and Oregon—cannon and muskets—shooting deserters, &c. &c.—God have mercy upon us!

I must confess my disappointment with the action of the House of Representatives upon this subject. How a great Library will tend to promote and diffuse knowledge among men to any great extent, I cannot perceive. To the dwellers in the Capital it may be useful, but to the country at large entirely valueless.

I should like to have your opinion of the proposed plan for a "Farm School," and whether there are any hopes left of ever having one

Very truly, your ob't serv't,
JAMES REES.

J. S. SKINNER, Esq.

UTICA, N. Y., April 11, 1846.

DEAR SIR: I have to acknowledge the receipt from you of a copy of the Report of the Select Committee on the "Smithsonian Institution." More pressing duties have prevented an earlier communication, according to my promise. I trust, however, that it is not too late now.

It was my intention to offer to the Committee a few considerations on the claims of Agriculture in connection with the application of the Smithson Fund; but I find this done so much better than I could do it—by J. W. HARDY, of Virginia, in the March number of Skinner's "FARMERS' LIBRARY AND MONTHLY JOURNAL OF AGRICULTURE"—that I will forbear. I beg leave to refer you to that publication.

Upon the details of an extended system "for the increase and diffusion of knowledge among men," I desire to offer a few thoughts.

With the main features of the reported bill, that is, the Institution to be created, I am well pleased—considering them to be more in accordance with the designs of the donor than any others previously proposed. I must, however, frankly confess my disappointment with the *meagerness* of that portion relating to *Agriculture*. It is, I apprehend, far short of what the interests and well-being of our country demand.

The bill provides for the appropriation of a lot of ground in the City of Washington "for Horticultural and Agricultural purposes and experiments." I do not know how large this lot may be; but I suppose it contains no more than 50 or 60 acres. This would be, I fear, much too small for the purposes designed and the successful conducting of the Institution. With the constant and increasing additions of rare plants, &c. which may reasonably be expected, the whole would soon be entirely occupied, leaving no room for active operations. It would thus become a mere *garden*, offering at best but few facilities for the acquisition of practical knowledge in the sciences named in the bill. Take, for instance, that branch of farm-science relating to manures. This is a subject of acknowledged importance. It requires a great amount of practical knowledge to know, of a certainty, the kind, amount, &c. to be successfully applied to different kinds of soils. The knowledge of Chemistry required is very different from what is to be obtained in the class and laboratory. *The open field must be studied.* For this purpose there must be room enough. A farm of sixty acres would be much too small for extended and satisfactory experiments in all kinds of farm and garden produce.

The Institution should be preëminently *agricultural*—in the most extensive and general use of that word. It should include the whole business of the farmer—which comprehends the cultivation of the soil, and *the management of live stock.* It ought also to include every description of territorial improvement, such as draining, embanking, road-making, planting, &c., all which are parts of the science of the soil. Any thing short of this would be unsatisfactory.

Again: Ample provision should be made by law for the reception of students in such a manner that the whole country may enjoy equally its benefits, and in such a way that the poor young men of the land may not be debarred from its privileges. As a body, the farmers of this country are not moneyed men. Money comes to them only by the most severe and constant labor, and then but slowly. They can but poorly afford to pay much for learning. It is

true, the bill proposes that the instruction of students shall be gratuitous; but it must be remembered that the necessary expenses for board, clothing, &c. would be more than 999 out of 1000 of the farmers of the country could possibly afford to pay. How, then, can this matter be so arranged that the poor man may feel encouraged to send his son to the "Farm School?" How can the charge which is so often made against institutions of this kind—that they are designed for the rich, and they only receive the benefits of them—be avoided?

These questions bring me to the plan which I wish to propose. I will give but a mere outline, and that as brief as possible.

In the first place, the farm should contain at least 1200 or 1500 acres. It should be—for convenient to market, procuring of manures, &c., located near a large city—say within five miles. A portion of this land should be applied to horticultural purposes. This large tract of land I conceive to be indispensably necessary for the purposes of the Institution. It would furnish full room for sufficient experiments with all kinds of grains, roots, fruits, grasses, manures, &c.—not merely with a handful of each, the results of which can never be confidently relied upon—but with bushels, thus testing at once the worth of an article presented. It would furnish ample room for the rearing and keeping of all kinds of farm stock, such as horses, cattle, sheep, swine, poultry, &c. of all the different breeds and crosses. Here, too, would be full room for all the details and out-door labor of the farmer, with opportunity for testing all machines and improvements designed to facilitate his labors.

Here, then, upon this domain, would be collected the best of every thing that a farmer would wish to have upon his own land. Above all, here would be opportunity for the young man who wished to be a real farmer, to make himself acquainted with the whole science, from its most intricate mysteries down to the minutest details of every-day labor.

An extended system of exchanges of all farm produce, &c. should be kept up with foreign countries, and citizens of this country. Nothing which is the produce of the soil should be *given* away. An equivalent in kind or value to be returned in all cases. Of stock, none but the best being kept, an excellent opportunity would be always at hand for the purchase of such as any buyer might want.

Upon this domain should be erected the buildings of the Institution—convenient and large, but in plain, farmer-like style. The dwelling-house should be large enough to accommodate 500 students, with the Professors and their families. Another building located near the dwelling would be required for the Library, Laboratories, departments of Geology, Mineralogy, Natural History, study rooms, &c.

Ample provision in the way of acres, buildings, &c. being made, the number of students should be limited to twice the number of Representatives in Congress—that is, two shall be chosen by the Representative from each Congressional District in the Union. This plan gives the whole country an equal participation in the privileges of the Institution. The term for which students will enter should be two years. At the commencement of the first year, however, the students should be divided into two classes, one of which will leave at the end of the first year, the other to continue the full term. This plan of classing the students, by which one-half the aggregate number would be renewed every year, will prevent the embarrassment of entire new classes at the same time.

Each student should be allowed pay of a sufficient amount to meet the necessary expenses of a two-years' stay at the Institution, and also to serve as an encouragement to those who are poor, and who would otherwise be loth to avail themselves of the advantages of the Institution.

But, I think I hear you exclaim: This will cost too much; where is all the money to come from?

Briefly, I will tell you: The farm, buildings, &c. would in any case require a large outlay. The only difference between the bill and the plan which I propose, is the increased amount of land. The buildings, furniture, &c. would be nearly the same. The labor of the farm, such as fencing, ditching, preparing of ground for crops, harvesting, &c. would all be performed by the students. It may reasonably be expected that when fairly in operation, the produce of the farm would feed the Institution. I think that in a few years, with the farm fully stocked, soil improved, and a rigorous system of economy enforced, a considerable revenue would be obtained from sales.

If this be so, then the only demand for money would be to pay the salaries of officers and students. Assuming that the whole number of students would be 460, at a monthly pay, besides board, which would be furnished by the Institution, of $8, or $96 a year, the amount would be—

For students	$44,160
Professors, teachers, &c.	20,000
For Agricultural Department	$64,160
Estimated amount required for Normal School	41,880
Total	$106,040

Here there is an amount of $106,000 required annually for the support of the Smithsonian Institution; and a revenue of interest from the principal of the Fund of only $30,000, leaving a deficiency of $76,000. Whence can this amount be supplied? I answer, *From the general Treasury.*

Let us look at it for a moment. Congress is appropriating millions annually for the Army, Navy, &c. while occasionally it reluctantly gives a few hundreds for the furtherance of the peaceful Arts and Sciences. The Report of the Auditor of the Treasury shows that during the year ending June 30, 1845, there was expended under the direction of the War Department the sum of nine and a half millions, and by the Navy Department six and a quarter millions of dollars—making together, as the cost of sustaining the war machinery of our Government, the enormous sum of *fifteen and three-quarter millions.* Commerce, like the horse-leech, is constantly crying, "Give, give!" and the money is given. If asked for what purpose the money is required, the answer is, that the interests of the country demand it. It is said that by protecting commerce, the farmer and mechanic are also protected. Now, if this be so—and I will not dispute it—why not appropriate a portion of this money in a *direct way, for the benefit of the farmer and mechanic?* If the different branches of industry are so indissolubly connected with each other that one cannot be promoted without benefiting the other, then the commercial will be advanced in proportion to the extension of Agriculture and the useful Arts.

An expense was incurred during the last fiscal year of $143,000 for the Military Academy at West Point—the sole object and result of which institution is, in plain English, to teach men the best way to butcher their fellow-men. It is useless to find fault with this and kindred institutions. They will, in all probability, be sustained for a long time yet, until "nations shall learn war no more;" until they will learn that a better protection is afforded by the practiced principles of Truth and Justice, than by Armies and Navies. But I *do* complain that so little is done to promote the pursuits of peace and industry. Is it not high time that our course was changed in this matter? An opportunity is now offered: Will it be embraced? Will the Government niggardly refuse an appropriation of $80,000 to $100,000 a year, "to promote knowledge among men," while more than that sum is cheerfully granted to the West Point Academy? I hope not.

I have made an estimate above, for the Normal School. I will say a few words in explanation:

The object of this school, if I understand it correctly, is to prepare students for teaching. "It is not the design or province of a Normal School to communicate to its pupils the elementary departments of knowledge, but to perfect them in those departments, and, above all, to mould their habits, and discipline their minds in the art of teaching." "It is not expected that individuals will be received as members of this Institution who are not already acquainted with those departments of education which are usually taught in our schools. Their knowledge of all the elementary branches is here to be reviewed and made perfect; and in addition to this they will be carefully and practically exercised in the best modes of teaching all those branches." [Address of Hon. S. Young, on opening State Normal School. N. Y. State Senate, Dec. 24, 1845; p. 20.]

If this be the design, and I believe it is, the school should be located in the City, where experimental schools may easily be established, and also for convenience to students. I would then propose that a suitable building be erected in the City of Washington for the Normal School. The number of pupils to be the same as in the agricultural department, 460, and selected in the same manner. Three terms of 13 weeks each in a year, leaving a vacancy of about 30 days between each term. The pupils to remain during two terms, or 26 weeks, at a pay of $2 per week, without board. This, with $6000 allowed in my estimate for teachers' salaries, &c. would make up the amount above stated.

I will not detain you by reciting the advantages to be derived from such an establishment as I have endeavored to shadow forth; I will merely say, without any improper partiality for my own plans, that I can conceive of no more effective means for carrying into effect the designs of the donor. From this Institution there would graduate, every year, an army of enthusiastic scholars who have availed themselves of all the bounties which a great National University could give. They will spread themselves all over the Union. They have made themselves intimately acquainted with the works of Nature in their most attractive forms and purposes. They will become at once the "diffusers" of that which they have received.

One word, and I have done. The farmers and working-men of this country begin to think of their claims to a share of the bounties of Government; they will act ere long. The time is not far distant when, for every dollar appropriated to the purposes of the war establishment, there will be another dollar *demanded* for the works of peace and industry. Why not wisely begin now?

Commending the whole subject to the wisdom and patriotism of the Select Committee and Congress,

I am, very truly, your ob't serv't,
JAMES REES.

Hon. ROBERT DALE OWEN,
Ch'n Select. Com. on Smithsonian Institution.

Remarks by the Editor.

On the preceding we take leave to remark that we have never dared hope, with any degree of confidence, that the rare and glorious opportunity which this bequest of Smithson presents for the diffusion of *useful* knowledge would be availed of for the benefit of *Agriculture*, in any thing like the proportion which that interest bears when contrasted with them, to all others united. We should be greatly and agreeably disappointed if it be not altogether sequestered.

In a life-time filled with anxiety that the tillers of the soil should understand and make good their claim to paramount consideration in the legislation of the country, we have been but too well aware that lawgivers know that this great national concern is everybody's business and nobody's business. Too well do they know that, when the landholder is caught by the politician to be sheared, he displays not even the power to kick, or squeal, or bark, or bite! Not having studied the case, he knows not, or seems to know not, where to turn or what to do! Touch but a hair of any member of any other class, and the back of the whole sty is up in a moment. Equally among the press and among politicians, every other industry has its advocates. By whom are the leading papers of the country prompted to bear down, on occasions, with all their influence, on the judgments and the fears of Congress? Do not these papers, of widest circulation and most power, draw their life's blood from classes that subsist on the parings of Agriculture?—parings that are often cut into the very core of the fruit?—so much so, that after the produce of the farmer passes through the hands of the merchant, and the miller, and the tradesman, and those who live on the contentions and the maladies of the producer, there is scarcely enough left him for seed! What special organ stands ready to speak out for him, and to denounce the burdens which fall upon him in various forms that he does not see? Where, again we ask, where are these organs?—and Echo answers, "*Where?*" Even our own more able colleagues in the great cause deem it not pertinent to vindicate the political rights

of the plow, in apprehension of reproval and withdrawal of—whom? of whom does the reader suppose? Why, of the *agriculturists themselves!*—such agriculturists as may be likened, not to the fabled Centaur—half horse, half man—but to the tadpole in his transition state, with two frog's legs to his body, being one-third farmer and two-thirds partisan. Can any thing present a stronger proof of infatuation or blindness on the part of the agricultural community, than this very apprehension of their taking offence at the exposure of the impositions with which they are saddled? We, too, design to keep our skirts clear, perfectly clear, of the mud and the mire of *party strife.* Never shall the FARMERS' LIBRARY mingle in the fray for mere party ascendency, or scuffle for the picked bones dispensed to their followers by those who fatten on party spoils; but that resolution shall not blind us to the wrongs which parasitical classes are ever on the watch to inflict on the great, all-producing agricultural industry of the country; and in this we respectfully invoke the aid of our associates of the agricultural press; for with antagonistical, partial and vicious legislation, how can Agriculture ever prosper?

As is so forcibly set forth in the preceding letter, if it be pretended that all the appropriations for the "warlike machinery" of the Government be in truth so much dedicated indirectly to Agriculture, by protecting her hand-maid, Commerce—why not give some of it directly to Agriculture, that great producer for all? Why dress out and provide so much more sumptuously for the *maids* than the *mistress?* Does it not always and justly give rise to injurious suspicions? Some contend, and we do not say untruly, that the hands of Congress are tied—that Agriculture is the only concern of the people left unprovided for and unprotected by the Constitution. Well, if so, why pretend by an underhand, stealthy, and altogether unworthy and inadequate device, (and as a set-off against the $140,000 annually to the Military Academy,) to make provision for the diffusion of agricultural information by giving a pittance for the publication of the *Patent Office Annual!* Yes, this Annual is the great boon which Uncle Sam has the meanness to print and the impudence to offer as a set-off against the hundreds of thousands expended in the publication of military memoirs, and surveys, and maps, and books; and, after all, at whose expense are these government periodicals issued? Who is their Editor? Out of what fund are they printed? Where are the materials procured, and how and to whom at last distributed?

A short answer to these questions tells the whole story:

The materials have been heretofore cabbaged, in large proportion, and that, in many cases, without acknowledgement, from the works of individuals who give all their time to the collection of the knowledge and the facts, and look to their publication for support. Nay, more; in this contest of individuals against fearful odds, this great old Uncle Sam has the meanness not only to plunder without acknowledgment, but to pick the pockets of poor inventors to pay the expenses of printing! The least that he should be required to do, in common decency, when he comes forth with *his* annual, to rival and cut off subscription from the quarterlies and the monthlies and the weeklies of individual rivals, who publish on their own hook and pay their own expenses, would be to give to his periodical not only the Government imprint, but a fair and honest title-page, as thus:

UNCLE SAM'S ANNUAL
OF
STRANGE MECHANICAL AND AGRICULTURAL DISCOVERIES;

Interlarded and mixed up with all sorts of Agricultural Curiosities and Humbugs; compiled by Uncle Sam from the studies and labors of individuals, Editors and Publishers who follow the business for a livelihood, and printed and paid for out of a tax on poor Inventors—which is not generally understood—at an expense not exactly all told or easily ascertained, and distributed by Members of Congress, under their frank, nominally, but really by a tax for transportation to come out of the Treasury—and that not to curious agricultural inquirers, too poor to subscribe even for the cheap agricultural papers, but to penurious men of fortune who are too stingy to do so, or to politicians on whom the distributors can best reckon for that support which shall enable them to put it in the power of Uncle Sam to play off the same piece of injustice and humbuggery from year to year; printed at Uncle Sam's Press, but chiefly at the cost of the Planters and Farmers generally—though they do n't suspect it, nor is it intended that they should; yet the money for it is raised by impost duties on all the commodities *they* consume, making a very large proportion of all the income of the Government. All Editors are expected to puff this Annual, agricultural Editors especially.

Such is the title we propose for Uncle Sam's Annual. When Government or public institutions publish their own periodicals, or adopt others, and give them exclusively the benefit of their funds, countenance, or facilities, they ought at least to avow it honestly and aboveboard.

For ourselves, we here put on paper what we have elsewhere and otherwise offered:

☞ TO ALL INVENTORS OF USEFUL, NOT HUMBUG, AGRICULTURAL MACHINERY—Greet-

ing: *If you will yourself, or by your agent for Patents, send us a good drawing of your machine or implement, we will have it engraved in the best manner and published, without charge, and distributed through every State, among the most enlightened and respectable agriculturists in the Union—Provided you will accompany it with the explanations necessary to a comprehension of its principles and operation.*

Finally, if there be no difficulty of a constitutional character to forbid Uncle Sam from using his power and facilities for setting up as Editor and Publisher of agricultural periodicals, what is to hinder him from starting one on *Medicine and Surgery?*—to illustrate these subjects and the inventions connected with them, in rivalry with the Medical Repositories? Or, would it not be a more generous, manly and efficient mode of diffusing agricultural intelligence, if the old gentleman, instead of turning Editor and Publisher himself, would take the same amount to pay for distribution, free of postage, of the agricultural papers, which would gladly disseminate, without charge, all that his Annual contains, which is honestly come by, and that is *original and worthy of publication?* As for military pamphlets and books, and whatever smacks of brimstone, and blood, and all the "pomp and circumstance of glorious war," these he publishes already by the tens of thousands, because that is quite *constitutional!* Behold, farmers, a few items which you are to pay for—

"For three months' *extra pay* to non-commissioned officers, musicians and privates	$16,000
For transporting officers' baggage	50,000
For preparing drawings for a uniform system of artillery	7,000
For military and geographical survey of West Mississippi	30,000
Total	$103,000

True, for all these military memoirs, and maps, and diagrams, and drawings of the machinery and implements of human destruction, the farmer and the planter foot the bill, and cry huzza! huzza!—too well content that against the millions that go. for these purposes, out of the common Treasure, *he* should get, for *his* share, this *Patent Office Annual!* made up out of the brain-work of poor Editors, and printed out of the brain-work of Inventors poorer still, if possible. Truly, we are a wonderful people!—and this a "*model Republic!*"

Why not place the Normal School, the great feature in the plan, at Washington, and, for the farm, buy the 1500 acres at *Mount Vernon*, there to infuse the spirit of *patriotism* as well as to sow the seeds of knowledge? $25,000 a year for a Library for the use of J. Q. ADAMS, D. H. LEWIS, Mr. MARCH, Col. BENTON, and a few other ingenious and learned men of investigating habits, who lock up too much of what they already know—what, we repeat with Mr. Rees, will that do toward the *wide diffusion of useful practical knowledge among men?*

THE DROVER'S DOG.

WE have deemed it well to let the owner of *Boxer* and *Rose* tell his own story, seeing that he has accurately described, and in no measure exaggerated, the qualities, or overrated the value, of the subjects in hand.

The originals, which we have seen, and which are undoubtedly genuine of their breed, are truly represented in the Engraving. These are of the kind of dogs referred to by Mr. COLMAN, in one of his valuable Reports, in which we are favored with accounts, so graphic and interesting, of the *various markets* in England and Ireland. In one of these he says—"For a week or more before the tryst, the roads leading to Falkirk will be found crowded with successive droves of cattle and sheep, proceeding to this central point; and it is extremely curious on the field to see with what skill and care the different parties and herds are kept together by themselves. In this matter the shepherds are generally assisted *by their dogs*, which appear endowed with a sagacity almost human, and almost to know every individual belonging to their charge. They are sure, with an inflexible pertinacity, to bring back a deserter to the flock."

As to any law to restrain effectually the keeping of worthless, "sheep-killing dogs," that would be incompatible with universal suffrage and the largest liberty. How could one expect the demagogue, ever scheming with eye intent on the "spoils of office," to vote for a law essential to the success of a great branch of national industry, when by so doing he may jeopard his popularity and lose the votes of a score or two of loafers?

For the Large Gray Wolf, such as is yet common in the high lands of some even of the old, abused and plundered "Thirteen," and yet more so in Texas, there is no dog that can stand up against him, unless it be the breed of Mount St. Bernard, or of *Auvergne*, which our friend

G. W. LAFAYETTE says "are equal to those of the Alps."

It happened lately, near Tuskegee, Alabama, that a celebrated wolf, which had left one of his feet in a trap, and was yet the terror of the neighborhood, was by some means captured alive. The owner of two dogs of redoubtable strength and ferocity maintained that, for a wager, one of his dogs should master the wolf—and they were accordingly brought together; but he soon saw that his dog was overmatched, and, abusing his power and forgetting or trampling on the right, as man will ever do, he turned in the second dog, when the gallant wolf was dispatched with as little mercy as he had shown to his victims.

BOXER—THE ENGLISH CATTLE OR SHEEP DOG.
ROSE—A SCOTCH COLLEY SLUT.

The above were imported by B. GATES, of Gap Grove, Lee Co. Illinois; and were selected with great care in Europe. The Colley is much better known in this country than the English breed, which is a heavier dog, uniting strength with intelligence, and therefore better adapted to protect from wolves or sheep-killing dogs.—Yet he would not be able to conquer the Large Gray Wolf alone; but those are not often met with, unless in parts thinly populated. Our greatest enemy in Illinois is the Prairie Wolf, which is numerous.

Much has already been written on the intelligence of the Scotch Colley. My opinion is that the English "Butcher's Dog" is no way lacking on that point. Any reader who has visited Smithfield Market in London, on Monday or Friday, will, no doubt, have formed the same opinion. There you have an opportunity of seeing a number of these useful animals at their work. It would, in fact, be almost impossible to conduct this Market without their aid. There a vast number of different flocks are brought for sale from all parts of the country, to supply this great Metropolis, and are collected in the smallest possible space. The difficulty of keeping them from mingling with others falls principally on the dog. If one slips away, or a particular one wished to be caught, it is pointed out to him and is returned back, or held till the owner takes it—the dog always holding them by the side of the head, so as not to bruise the body.—By a word, or motion of the hand, they will run over the backs of the sheep, to stop them or turn them in a different direction. I have often admired with astonishment their quick and intelligent actions. They appear to read the thoughts of their master by his countenance, for their eye is continually on his, or the flock. Nothing else can attract his attention when he has work to perform, and at times I have thought he acted with more judgment than the owner.

Having had some experience in the unpleasant task of walking two or three miles for the cattle or sheep, after a fatigning day's work in the harvest field, I was determined, if possible, to obtain one of these labor-saving animals, and let him take that part—as I have often known

them to go alone and bring up the stock every evening. Farmers generally, as well as others, are fond of getting labor-saving machines.—What is the difference whether it be a dog or machine?

The breed of *Boxer* is sometimes called the Drover's or Tailless breed.

In the N. Y. Farmer and Mechanic of April 30, 1846, the estimated loss of sheep annually destroyed by dogs in the State of Ohio is stated at $80,000. One farmer lost fifty in one night. If such loss takes place in one State, the amount must be enormous, including all—enough, I should judge, to awaken sheep-raisers to the importance of keeping a sheep-protecting dog, in preference to these murderous, sheep-killing curs. Kill them off and sell their hides, and the produce would soon be sufficient to stock the country with a different race.

In some parts of Europe they take the pups from the slut, and let them be suckled by a ewe and grow up with the flock—when, in case of danger or fright from strange dogs or enemies, they immediately run to their protector, knowing he will not suffer them to receive any harm.

Youatt says instinct and education combine to fit this dog for our service. The Pointer will act without any great degree of instruction, and the Setter will crouch; and most certainly the Sheep Dog, especially if he have the example of an older and expert one, will almost, without the teaching of the master, become everything that can be wished—obedient to every order, even to the slightest motion of the hand. There is a natural predisposition for the office he has to discharge, which it requires little trouble or skill to develop and perfect.

THE OLD GRAIN-GROWING AND PLANTATION STATES.

THEIR CAPACITY TO GROW THEIR OWN WOOL AND WEAR THEIR OWN CLOTH.—FACILITIES AND IMPEDIMENTS.

THE notes which follow this hasty introduction, and which are taken from the last Number of the "TRANSACTIONS OF THE HIGHLAND AGRICULTURAL SOCIETY" of Scotland, may prove both useful and interesting, as they are drawn from the experience of a district of hilly and high country—in some material respects resembling certain regions in our own—which appear to be in a fair way of being appropriated to the same branch of industry. They will serve, at least, to afford to a certain extent, a standard of comparison between the weight of fleeces and of wool, and the prices for the latter in America, and in that country where the whole business of sheep husbandry is probably pursued, with as much judgment and exactness in all its bearings, as in any part of the world.

One powerful consideration, which forbids with us the pursuit of certain Agricultural objects which are followed with profit in Europe, under circumstances of general similarity, is the great difference between the *cost of labor* there and here. But in the business of *raising Sheep*, and *growing Wool*, the labor employed bearing so small a proportion to the results, the crop being so large, compared with the culture and the harvesting, this consideration in the cost of production, loses its force in a great measure, and leaves it a matter of just wonder and reasonable inquiry, how it can be, that raising Wool at existing prices, should constitute still an attractive and profitable pursuit, in such countries as the stormy and snow-capped hills of Scotland and Vermont, and yet not be pushed to a much greater extent than it is, in the mountainous and cool regions of the southern and south-western States? We have a right to characterize the Sheep business as being attractive and profitable among the people to whom we have referred, for all who know anything of their character will admit that they are not the people to persevere in any path blindly, and without looking ahead to see where it leads. If the Scotchman says to himself, "Riches are got wi' pain, kipt wi' care and tint wi' grief," it is equally the good maxim of the Yankee to "look before he leaps."

We do not see, in fact, how it would be easy to designate any one source from which the aggregate income of Maryland, and Virginia, and Georgia, and the Carolinas could be so largely and easily augmented, and with so little outlay, as it might by the increase of their flocks of Sheep—improving them by a sufficient infusion of the blood of breeds that would ensure, according as circumstances may invite, either greater weight of meat or more or finer wool.

To this, however, there is one great difficulty: need we specify what that is, or is not every reader ready to answer—*popularity hunting!*

Yes, that is the festering sore that stands so much in the way of wise legislation, and mars so many measures that prudence and forecast would suggest for the great interests of the country—especially the Agricultural interest on which so many others live and prey.

Virginia, for instance, instead of her 1,300,000 sheep, of "no particular breed," (as appears by the last Census), might easily, and without diverting any of her capital, support an additional number of sheep—say at least 700,000, making 2,000,000—at a cost to the flock-owners of not three cents a pound, and even then have not one-fifth as many per acre as New-York, which carried more than 5,000,000 by the last accounts.

We feel warranted in saying, at an expense of not more than three cents to the pound of wool, keep them, for Mr. COLES, a Member of Congress from that State, once assured us that he carried a flock of two hundred through the year, in good condition, at an expense of not ten dollars a year for all the salable product or staples they consumed. The first and chief step toward this extension of a plain, simple business, that any one may understand *if he will*, would be merely to retain for a year or two, the natural increase of existing flocks, crossing them where necessary, as before said, with rams of the most desirable blood.

True, says every landholder, I have much waste land well adapted to afford the requisite pasture for increased flocks, but the too probable result would be that scarcely could time enough elapse for the increase of the flock to the number proposed; and the requisite inquiries be made, and system adopted, for their sustenance and management, and the sale of my wool, when some gentleman's sporting-dog, or some loafer's cur, not more thievish than his owner, would break in and ruin what he did not kill—as a flock is sure to be ruined by the agitation and fright of having a portion of it thus destroyed—a fright which seems to leave on it a mortal blight from which it never recovers.

This increase of only 700,000 sheep in Virginia, (to which we refer in the way only of example), supposing the clip to average three pounds, which is less than even the small Sheep of the Cheviot breed mentioned in the following notes, and the price to be only fifteen cents per pound, and here would be to her landholders an augmented annual income of more than $300,000 from wool alone, allowing nothing for the Sheep—leaving them to pay expenses and keep up the flock to the standard number. And this sum is annually sacrificed to the State, owing in a great measure to a groveling fear of *losing votes!* To impose the fines and penalties, which ought to be five times the amount of the value of the Sheep killed, would be, forsooth, incompatible with "the largest liberty!"

The fine, we repeat, should not be limited to anything like so little as the actual value of the Sheep killed, because the damage to the owner consists in the disorder, which falls like a malediction of some evil spirit on all that survive the ravages of the dog; and to the State it consists in thousands being thus deterred from establishing new or extending old flocks, who might otherwise do it, with very little additional expense for labor or food, on their present landed possessions, and the immense tracts of unoccupied lands in the Carolinas and Georgia—lands now yielding absolutely nothing, not even the amount of the taxes paid on them.

Let it not be said that if flocks were thus extended wool and mutton would be of no value. Mutton, we doubt not, might be smoked and sent abroad, or made to constitute a part of the very liberal ration allowed to the negroes in these States (where the usual weekly allowance is now not under three pounds of good bacon, or full equivalents,) and the wool might be worked up on the premises of large planters, very economically, in every view, as we believe, by one of "Chase's Carding Machines," manufactured and sold on account of Mr. GEORGE LAW of Baltimore, as advertised on the cover of the April Number of the FARMERS' LIBRARY.

By using this machine, they can make of their refuse cotton the basis of a thread, which this machine covers with coarse wool: or otherwise, every farmer and planter may either exchange his own wool for cloth, or have it woven on his own account at small water power factories, such as it will elsewhere in this Number be seen are now in operation in Maryland, and such as, if sufficient wool were grown in the surrounding country, would spring up spontaneously, as it were, in every neighborhood, to consume the raw material and supply the cloth. In this way might every State, and every County in these old grain-growing and plantation States, revive and sing again, as in the early and virtuous days of American Independence, the good old song,

"I shear my own fleece and I wear it."

Thus could they clothe their household, great or small, from their present but unused resources, instead of being fleeced and taxed by those who have the sagacity to practice on the wise maxim of selling as much, and buying as little as you can, if you would enjoy the blessing—the *priceless blessing of real independence.*

The writer of these hasty observations remembers to have once asked the late NATHANIEL MACON of North Carolina, whether there was any law in his State restricting the number of dogs, or otherwise protecting the owners of sheep from their depredations? "No, Sir," said the venerable Senator, somewhat impatiently, "nor *would I live* in any State where there was *an anti-dog*

law! Every negro I have owns one, and I own thirteen, sir."

The choice throughout all these States seems as between sheep and dogs, to let the latter go and feed upon the former *ad libitum.*

The celebrated JOHN RANDOLPH inculcated special contempt for sheep, by stating on some occasion in his place in Congress that he would at any time "go out of his way to kick a sheep!" and that so much more truly great and useful benefactor of American husbandry, the late Col. John Taylor of Caroline, Virginia, whose portrait and memoir we yet hope to give to our readers, dedicated chapters of his *Arator* to the denunciation of this harmless, docile and useful animal—what wonder then that sheep should still be, as it were, under the ban of these States and their communities continue to send abroad immense sums of money for what all circumstances seem to invite them to supply for themselves? What wonder that it is deemed better policy to forego this source of easy income altogether, and to pay for transporting their wool to New-England and the cloth back again; instead of selling the wool to the manufacturer with provisions also to feed him on the spot?

We could excuse this, as it seems to us, *dogged* obstinacy or infatuation, if it were founded on a genuine redeeming love for the pure-blooded of the canine race—from that love which prompted the last words of the son of Lord Ellenboro', when looking up to him for the last time he added: "*And father, you'll take care of poor Pincher, won't you?*"

But shame to say, the noblest is confounded with the basest of his race, nay the vilest cur without one drop of high or gentle blood is kept most especially in the eye of the time-serving legislator, who, for sake of his own popularity would allow to run at large every mongrel that comes into the world, to the disgrace and exclusion of the well-bred dog, and to the detriment of the States mentioned, to the amount of millions annually.

Are we not a glorious people? and are not *farmers* and *planters* of all others least apt to be *sheared* of their substance, by non-producing patriots! What is the *proportion* which is really paid by *them*, to make up the life-pay and the overgrown fortunes of men, in and out of the armies and navies of the world? Officers and contractors, who batten and fatten on the "pomp and circumstance of glorious war!" And this tax (of more than 300,000,000, since the last War) being levied indirectly, is paid willingly, for—good easy souls, they never suspect it—"They know not what they do!"

On the wool imported from the United States into England, the following remarks occur in a late report on the wool trade of that country:

UNITED STATES.—The import from this quarter affords a striking proof of the beneficial effect of the remission of the wool duty. It has excited great interest and surprise in the trade, and may be considered the greatest novelty of the year. The quantity received to this period, as an *experiment*, exceeds 3,800 bales, comprising a great variety of qualities. It is to be regretted that the unfavorable turn of trade has been against the operation. In washing and preparing the wools sufficient pains have not been taken; and there is want of discrimination in the selection of qualities. So far as used they have been highly approved: and we have full confidence that, if got up with care, they would be highly esteemed in this country. The American prairies afford peculiar advantages for the growth of wool; and we believe this branch of the trade will become one of great and increasing importance.

PERUVIAN AND ALPACCA.—Till within the last few months the supply of sheep's wool was limited. It is now increased, but the demand is restricted at rather declining prices of late. The imports of Alpacca have been rather large. There are no means of ascertaining the exact quantity, but a careful investigation leads us to estimate it at about 18,000 ballots of 80 lbs. each. It must be borne in mind that, during 1844, great difficulties attended the shipment, and the apparent excess of 1845 represents a portion of the previous year's clip. For the first six months there was great activity, and consumers bought freely for arrival. The demand has since been heavy, at almost nominal prices. The high rates abroad render it probable that considerable loss will attend the import.

THE EGG TRADE OF CINCINNATI.—We copy from the Cincinnati Gazette the following statistics of the Egg trade of that city, from which it appears that the business in that fragile commodity is quite an item in the sum of her productive industry.

Shipments from Cincinnati the past year,	963,000 doz.
Annual city consumption,	1,213,333 "
Total number of eggs brought to Cincinnati market	2,176,333 doz.

or *twenty-six million, one hundred and fifteen thousand, nine hundred and ninety-six* eggs.

This certainly shows a very commendable degree of industry on the part of the Buckeye and Hoosier hens, as well as praiseworthy care in their owners and others in gathering up the product and bringing it to market.

A farther recapitulation shows the following results as to value:

Value of 10,700 barrels of Eggs shipped from this port, at $8:44½ per bbl.	$90,361:50
Value of 1,213,333 dozen eggs consumed in this city, at 8 cents per dozen,	97,066:64
Total annual value of the Egg trade of Cincinnati,	$187,428:14

One hundred and eighty-seven thousand, four hundred and twenty eight dollars, and fourteen cents!

The Cincinnati eggs principally go to New-Orleans.

APPLICATION OF STEAM TO AGRICULTURAL PURPOSES.

RECIPROCAL DEPENDENCE OF THE DIFFERENT ORDERS OF SOCIETY, &c.

Mr. BOLLING, of Virginia, as we believe we have before mentioned, has a steam-engine in operation on his large wheat-farm on the James River. We understand it works to admiration, and causes no fear of damage by fire. On the estates near Darien, Georgia, under the control of one of the most accomplished agriculturists in any country, Mr. J. H. COOPER, there is more than thirty thousand dollars' worth of machinery of different sorts, all made, except the "Bolton & Watt" Steam-Engine, by the negroes on these estates, and *all* managed by them. They are found, in fact, to make excellent engineers, so far as the management of steam-engines is involved.

In a communication to the Albany Cultivator, descriptive of the establishment of the "*Rochester City Milk Company*," for the accommodation of 100 cows, it is stated that the cellar is to be used for roots and milk-room, and also a part of it for a small *steam-engine*, employed to cut up and steam the food for the cattle, pump the water from the river to supply the reservoirs in the building, and to *heat the stable in the winter* by the steam.

The late NICHOLAS BIDDLE, among the most accomplished scholars and gentlemen that our country has ever produced, and a zealous and enlightened friend of its Agriculture, exemplified on the banks of the Delaware, the great thoroughfare of American travelers, the practicability of watering gardens, and irrigating surrounding and higher grounds, at pleasure, by means of a four-horse steam-engine, drawing from the river an ample supply of water for all purposes.

Thus it would appear that, changing but a single word of an article on this subject in the last Number of the FARMERS' LIBRARY, we may consider it as already demonstrated that the *American* farmer has it in his power, at a moderate expense, on almost every farm, to lessen the labor of the barn, to extend its (steam) application to various useful purposes, and to place farm economies in a position of advancement which they have not hitherto attained.

If this Milk Company can have a steam-engine at work in the *cellar* of a *stable*, containing all the food of the cows, much of it so combustible, what is to hinder any farmer and planter from having one where his operations are on a scale to justify and call for it? The Sugar-Planters have them *in* their sugar-houses. There is one at work night and day in this building where we are writing, corner of Nassau and Spruce streets, New-York—a very large building of five stories, in which a great variety of business is carried on. Why should not *tobacco be pressed* as well as cotton is pressed, by steam? We do not mean that a steam-engine should be erected on purpose, but that besides threshing grain, cutting up corn-stalks and straw and vegetables, cooking them, where that may be deemed expedient, grinding all substances, and for all purposes—sawing plank, posts, rails, &c., the same engine might drive the tobacco-press, and prize, probably, 100 hogsheads in a day. It should pump, too, from a well or neighboring spring, all the water for the domestic animals, so that they need never have to go abroad, exposed to bad weather and wasting their manure.

The patrons of the FARMERS' LIBRARY have read it to little purpose if they have not learned not only the fact, but (what makes the fact so much more useful) the *reason* of the fact why a *certain degree of warmth* is equal to, and a substitute for, a *certain quantity of food*. The Milk Company at Rochester seem to be fully aware of this; hence, they say that the steam-engine to be employed in the cellar of their establishment is intended, among other things, to *warm the stable!*

This immense building, in a corner of which is the office of the FARMERS' LIBRARY, where we are writing, is heated through the winter entirely and throughout with *hot air*, created and diffused by means of the steam-engine in the cellar. Not a spark of fire is used anywhere in the whole edifice, except the coal fire in the furnace below; and thus, the chances for conflagration are, as the insurance probably is, (and certainly ought to be,) greatly diminished below what they would be if each room were heated by a wood or coal fire.

It would be well if farmers and planters, who dwell quietly in the country, too rarely excited to mental action, except at the instigation of selfish partisans and demagogues, would *habituate themselves to reflection* on all the wrongs they

suffer from partial government, and on all the means of economizing food and labor.

If they will only read the pages of this Journal, as it appears monthly, for a few months, we will "try," according to our poor abilities, to *amuse them into a habit of thinking* on their condition, and on the means of meliorating it; and if, with this habit of reading and inquiry, they could once in every few years mount the *back of a good honest horse*, (two friends traveling together with one pair of saddle-bags between them,) and take a ride leisurely of some hundreds of miles over the country, keeping their eyes and ears open—he must be of the *Rip Van Winkle* family indeed, who would not find his account in it.

Reader! these hasty thoughts are strung together and put on paper for what they are worth, before sunrise, in the midst of a population of near 400,000 people—all of whom, judging from the quietness of the streets, are yet under the influence of the "leaden sceptre," but, in two hours, what a change will have come over their dreams! These 400,000 consumers will have risen and *broken their fast on your products*, and will *swarm* every street, so that you can scarcely elbow your way along, like so many bees winging their way, each to gather what he can! Is it not, then, agriculturists, your clear and obvious interest that these town-consumers of your products should be as numerous and as prosperous as possible?—that they should have good health, good appetites, and pockets full of money?—*but not at your cost!* Nor will it happen at your cost, but by a partial and vicious course of legislation; and that will not occur, if you will take care that a system of education be established *throughout the country* that shall qualify your sons to prosecute Agriculture with a knowledge of the principles that properly belong to it as an intellectual pursuit, and that shall, at the same time, endow them with capacity to perform that most important of all duties—*the duty of making their own laws!* No, farmers! with these precautions for your own protection, it is to your interest that these consuming communities should become in your vicinity as numerous as the sands on the sea-shore, and as prosperous as industry and fair legislation can make them.

"To fix the happiness and virtue of a nation on a solid foundation," says a celebrated philosopher, "they must rest on a reciprocal dependence between all the orders of citizens."—But we had like to have forgotten the Rochester Milk Company.

Farmers may see and profit by this case, how readily men in towns lay their heads together to achieve, by concert and a combination of intelligence and capital, what cannot be effected when intelligence and capital act and operate as they do among farmers, who so rarely, and with so little perseverance, confederate for the protection of their own interests—the elevation and advancement of their own pursuits. The profits of this Milk Company will consist in the interest yielded on a money capital employed between the *hay and corn and milk producing* farmer, in the country, and the milk *consumers in town*—and, at first view, might seem to be injurious to the farming interest, by the amount of the saving of the cost of milk to the towns'-people; but does not that very saving enable them to consume an increased quantity of milk, or to lay out the amount saved for a freer indulgence in the use and enjoyment of other things produced in the country by Agriculture and Horticulture? If the mechanic or the artisan can get two quarts of milk for what he had to give for one, he can supply his young children with a diet almost indispensable to their existence in hot weather; or if saving in the cost does not lead, invariably, to increased consumption of that particular commodity, does it not leave the amount of the saving to be laid out in other commodities—necessaries or luxuries—products of the dairy, the field, or the garden?—in butter, in melons, in ripe fruit, in green corn, strawberries, or other things? This reciprocal dependence of the different orders of Society is, in fact, one of the most admirable orders of Divine Providence—inviting us to be grateful for and to emulate the benevolence it evinces.

But we must stop now to break our own fast, promising, some of these days, a chapter on the tendency and value of labor-saving machinery and capital to create demand for manual labor and agricultural products.

P. S. The Rochester City Milk Company furnishes the citizens of Rochester with pure and wholesome milk, at the following low tariff of prices:

Daily Average in One Month.	*From 1st June to 1st October.*	*From 1st October to 1st June.*
36 qts. and over,	2 cents per quart.	2½ cts. per quart.
12 " under 36,	2¼ " "	3 " "
2 " " 12,	2½ " "	3½ " "
1 " " 2,	3 " "	4 " "

To find the *average*, add the quantity taken in *one* month, and divide by the days in the month. [Albany Cultivator.

CEMENT.—In the New-England Farmer, vol. xii. No. 3, page 21, we find the following statement:

"The late conquest of Algiers by the French has made known a new cement, used in the public works of that city. It is composed of two parts of ashes, three of clay, and one of sand. This composition—called, by the Moors, *fabbi*—being mixed with oil, resists the inclemencies of the weather effectually."

No. II.....NOTES, AGRICULTURAL AND MISCELLANEOUS.

RAMBLES IN THE SOUTH.

THE CATTLE TRADE BETWEEN THE WEST AND THE ATLANTIC MARKETS.

[The first branch of industry in the order of observation was that of the *Tar and Turpentine* business of of North Carolina, (to which brief reference was made at page 544 of the last Number.) On that we were favored with a very full and satisfactory sketch by Colonel McCloud, of Smithfield, N. C. which we loaned to a friend, who unfortunately, and much to our disappointment, has not (this 20th of May) returned it. If recovered, it shall have in the next Number the precedence which it had in local order on our tour of observation. The author will, in any event, accept our hearty thanks for his kindness in preparing it, at our express and earnest instance.]

One of the most interesting and substantial branches of American Industry is that of *Grazing Cattle* in the West, to be sent in "droves" and sold in the Eastern markets. Some of its details may prove entertaining to the curious reader, however alien it may be to his own pursuits.

The business of the grazier and drover is, perhaps, nowhere better understood, or carried on with more spirit, than *in Kentucky!* and what better basis for it could any people have than such magnificent fields of *blue-grass* as are to be found nowhere else, perhaps, in the world —fields which afford a good bite even under the winter's snow, and in earliest spring look more like luxuriant grain, than grass pastures.

Nothing can be more charming to the eye of the traveler than her extensive forests, so clear and open that a huntsman may pursue the deer at the top of his speed, with the grass growing matted up so closely to every tree that it seems to have bursted up through a rich *blue-green* carpet.

This Kentucky blue-grass possesses that quality for thriving in the shade which recommends the orchard grass *(dactylis glomeratis)*, with this advantage over it, that it grows thicker and more evenly—not so much in tufts; while it equals it in the quality of early and late pasturage.

Many attempts have been made to propagate this noble grass in other, especially in more Southern States, but without any or with very limited success. We saw some at Mr. Daniel Turnbull's superb residence, near *St. Francisville*, Mississippi; but, with all the benefit that care and skill could offer, its growth was sickly and unpromising. These rich fields of Kentucky blue-grass serve, however, only to prepare her stock to be finished for market from her fields of redundant Indian corn. The one prepares the frame-work, while the other puts on the covering and fills the inside with fat.

Kentucky raises within her own borders all the beef with which she supplies herself, and, in part, the demand of the country. The whole number of fat cattle *driven* from the State annually is about ten thousand. They commence starting about the 20th of February, and continue to leave home until about the 1st of May. Of these droves, the last put in motion arrive in New-York about the 1st of August. By that time the grass-fed cattle from States nearer the market begin to re-supply the vacuum which had been filled throughout the winter and spring by the corn-fed beef from more distant regions.

As has been already stated, the beef fatted in Kentucky is the unbought produce of her own mountain ranges and blue-grass pastures.—About a third in number is supposed to come down from the highland Eastern Counties of the State—as White, Harlan, Letcher, Clay, Perry, Breathitt, Hite, Floyd, Morgan, Lawrence, Carter, Fleming, Bath, and Montgomery. These are of a smaller and more thrifty race of cattle—better adapted than would be a heavier breed to the rugged, woody country in which they are reared—without any special feeding, winter or summer, until about four years old, when they are sold in early spring, as lean stock cattle, for about 2½ or 3 cents a pound (that is according to what it is estimated they would make, net weight) to the grazier in the blue-grass Counties. He grazes them on his rich pastures through the summer, and with his corn, fed abundantly through the winter, they are prepared to move on by the first of February, to be sacrificed in the Eastern market—weighing there from 650 to 700 pounds. On this Kentucky corn-fed beef, the Irishman just escaped from famishing in his own country, for want of

anything—even potatoes, to eat, fills his belly every day with the eighth part of his day's earnings, paid him in hand and in hard money.*—These neatly made, small boned, native born cattle from the hill country are said to make sweeter and more palatable beef than the larger Durham, or other artificial breeds of imported origin.

A curious feature in this branch of industry is its natural and economical alliance with the *Pork business*. The herd of bullocks goes before, with one of swine—unclean beasts as they are—to follow after and clean up what has not been all eaten or thoroughly digested by their illustrious predecessors. No wonder the Hebrews detested them so heartily that they could not be brought to pronounce their name—so that the word *hog* is nowhere to be found, even in ALEXANDER CRUDEN'S Complete Concordance to the Old and New Testaments. No wonder that the resolute old Eleazar—when seized by the slaves of Antiochus Epiphanes, and his mouth wrenched open to force him to taste, or pretend to taste, swine's flesh—should have kicked and squalled, and chosen rather to suffer death than break the law of his God, as he understood it, and so "give offence to the weaker people of his nations." Such manly fortitude in resisting temptation to break the Law and the Constitution is admirable in all rulers—and the more exalted the more so, seeing how true it is that, the higher the post of the functionary, the more catching and pernicious is any bad example he may set, either in morals or politics; and yet a right hungry horseback-and-saddle-bags wayfarer, who should chance to come athwart a group of drovers, reclining near a cool spring, under the shade of a magnificent sugar-maple, on the great thoroughfare between Kentucky and New-York, with their ash-cake and pan of fried bacon, might not carry his antipathy to swine's flesh quite so far as did old Father Eleazar.—But *chacun a son gout*—in Gastronomy, at least. Let us return to the practical connection between *feeding bullocks* and *fattening hogs*.

In November, when the supply of grass begins to decline, the grazier begins to feed his corn to his cattle—stalk, blade, grain and all together. The corn which he gives them is never husked, or shucked, as it is sometimes called.—We should have elsewhere stated that the grazier often sends his agent up into those Eastern Counties to buy his stock cattle.

When the cattle have eaten what they will of the corn, thus thrown to them in its natural, rough state, the hogs are let into the field, through a "slip gap," to glean the remainder. This is found sufficient to sustain hogs—giving from 1½ to 2 hogs, weighing (gross weight) from 150 to 200 pounds each, at twelve months old, for each bullock. So that the grass and corn that graze and fatten 30 bullocks, will do the same for from 45 to 60 hogs, averaging 175 pounds each.

From the 20th of February to the 1st of March, when both are fat, they begin, as before stated, to move on their way, to supply the great hives of non-agricultural producers, that swarm in the Atlantic Cities—swarms that could not subsist without the produce of the land, to work up, and transport, and live upon; but without whom the agriculturist *could live*, but could not accumulate or prosper. Thus has Providence ordained that society should flourish by a reciprocal dependence of its different classes. Yet it always happens that the congregated and parasitical classes contrive to draw their life's blood from those who are spread over and doing the work of the country—producing its bread and its meat—all the while making them believe that they are feeding them. Variety of classes and division of labor tend to mutual benefit and the highest improvement in all the arts; but, in the action of the laws and the burdens of the Government, favor should be shown in proportion to the number and the utility of each. "*Render unto Cæsar the things which are Cæsar's.*"

It behooves the landholder to entertain a becoming jealousy of the non-producing classes—for it is in the nature of things that power should steal from the many to the few. See already how it has been contrived to have the Military elevated in the public sentiment, and favored by the legislation of the country, above the Civil, or the producing and the tax-paying portion of the community! and see, too, how besides, no inconsiderable portion of those who are educated out of the common treasure of the Nation, in the Military Schools, are selected expressly as being the descendants of men who have seen some service in *fields of battle*; but who ever heard of the appointment, to either of these Military Schools, of the son of a *farmer*, on the ground that the father had set to the whole country a salutary example of extraordinary industry and intelligence in the confessedly most useful of all human employments? Well, back to our cattle.

On their way to be slaughtered, the hogs travel at the rate of a mile a day slower than the herd of bullocks; so that, by the time they arrive at their common halting place for the night, the cattle have eaten their corn and hay. Of the first, they will eat what is equal to from a peck to a half bushel per day—taking one-third of their allowance in the morning, and the residue at night. The cattle, having thus satis-

* Those who dig up the old pavements in New-York now get $1 per day. The *pavers* get $1 37½; and the work is so done as to require to be re-done not less than once a year.

fied their hunger, all lie down immediately for the night, and by that time up comes the drove of hogs to sup on their leavings. Thus they travel on, day by day, making from 10 to 11 miles a day, and so reaching New-York from Kentucky in about 73 days. A drove of the smaller and more active native breed of cattle will perform the trip in about 65 days.

The curious fact in *Swineology* is affirmed by a Kentucky drover, that his hogs which weighed 150 at starting reached an average of 180 on arrival at New-York—being nearly half a pound a day while on the journey. On the other hand, the loss of weight—or "drift," as it is called—of cattle, is equal to 150 pounds, which a bullock of 1,000 pounds' weight at leaving home lessens on his way to the Atlantic butcher. This drift, or loss, it is observed, is chiefly first in the kidney-fat and fat of the entrails. It has been ascertained that a hog will set out on his journey to that bourne whence no *such* traveler returns, so fat as to have no cavity or vacuum in his corporation. If, as he journeys on, you don't feed him, he lives first upon and consumes his gut-fat; then his kidney-fat; and, lastly, his carcass wastes away.

The cross of the Berkshire has much improved the old Kentucky country breed of hogs, especially in their traveling quality—making a stock superior to the full-blood for the purposes for which they are designed.

In driving cattle, the practice is to stop (but not to feed), for an hour at mid-day, when the cattle in less than five minutes all lie down to rest.

A drove of 120 cattle, as easily driven as a smaller number, is usually attended by a "manager" on horseback and two footmen. One footman goes ahead leading an ox the whole way, say 800 miles. The manager on horseback takes his station behind the first forty head, and the third man on foot brings up the rear. There are stations along the whole route—country taverns, often kept by the owner of the adjoining farm, who thus finds a market for his own produce, and keeps at any rate, a constant supply of what is needed for the drover. Wending their way through Ohio, the farmer supplies them with that glorious plant, the pride of our country, Indian Corn, as they have feasted on it at home, stalk, blade, and grain altogether; but, when on their melancholy journey they touch the line of Pennsylvania, Mynheer brings forth his fragrant hay and corn already shucked, and finally, when they come late enough to market, they are turned at night into grass lots, prepared and kept for the purpose.

The cattle reared in the Corn regions of the West, especially in Ohio and Kentucky, have been heavily dashed with the Short-Horn blood, by which their average weight has been increased, it is said, about 200 pounds, with great improvement in their fattening properties and the quality of the meat.

A Kentucky farmer would now be very loth to let a Bull of the much vaunted old Bakewell breed, with his straight back and long horns and fat all to itself *overlaying* the carcass, come within a ten-foot pole of his herd of cows. Cattle with a strong infusion of the improved Short-Horn blood, as by the late celebrated Grazier Steenbergen, are still esteemed to be preferable to the full-blood, as being more thrifty and active. This improved breed has so increased, and high grades of the blood so widely diffused, that instead of the fancy prices from $300 to $500 for a yearling bull or heifer, such an one of good make will now fetch about as much as a four year old bullock well fatted—say from $40 to $50.

For obvious reasons, cattle are not so much transported on railroads in this country as in England, where the distances from the feeding place to the market are so much shorter. Cattle will go very well on a railroad for 12 hours together, but then they must lie down, which they cannot do in the cars like a hog, that lets himself down and sleeps on the space upon which he stands. The charge too, on the railroad in our country is too high. For lame bullocks that are sometimes sent from Harrisburg to the Philadelphia market, they charge half as much as it costs to drive them all the way—750 or 800 miles from Kentucky to New-York—the one being $8, the other estimated at about $16.

If cars could be, as in process of time they will be, so constituted for this purpose as that cattle could lie down, they might be so transported from distant points to great advantage, as this mode of transportation would save most of the "*drift*," or loss of weight which they undergo on the way, to say nothing of the deterioration which must ensue along with this wastage, in the *quality* of the meat.

But here again the farmer and the grazier, and individuals and States, may cry again on Hercules to help them in making roads to open up and transport their agricultural resources. As if, because it would incidentally aid Agriculture, Hercules won't help him even though it would so much contribute to strengthen his own favorite *military plans, power, and machinery!* Indicate to Uncle Sam a spot on the earth, a pocosin or a wilderness to be surveyed, and cut through purely and exclusively for the Army, and straightway he unlocks the Treasury of the People, and takes out millions to do the work; but only tell him, or let him suspect, that it is needed for the development of agricultural resources, to multiply the means of subsistence and the wealth and the population and improve-

ment of the country, and the promotion of industry and the arts of peace, and like a terrapin he says, I have no power, and draws himself into his shell; or if he speak, it is only to denounce all such useful and peaceful enterprises as odious monopolies and contrivances of the Devil, and the enemies of the individual right of every man to do just what he pleases. *But*, when they *are done*, if you ask him to pay what an individual would have to pay for the same service, he abuses the directors as extortioners, Jews them down to the last cent, instead of being glad in this way, indirectly at least, to give them a helping hand; and after all, when his warlike machinery is to be put in operation, if you did not give him the use of these very works (which he denounced and refused to assist in constructing), to give ten-fold efficiency to his man-killing operations, he would press, seize upon *vi et armis*, and use your road and your canal, just as the commander of an army, with his long-sword and life commission, would press any farmer's horse or wagon into the public service. Truly, farmers are a wonderful vigilant and self-redressing class of people, and Uncle Sam the meekest and most self-denying hater of monopolies under the canopy of a righteous heaven!

The system of selling their cattle is the last act in the drama. For this purpose the grazier calls in the assistance of his "*agent*" in the large towns. Here, too, is another of the branches of business or divisions of labor, cut out for mutual convenience, but, *as usual*, at the farmers' or graziers' or countrymen's expense! His agent is kept constantly advised by his manager of the approach of his cattle, as they come "marching on their winding way," so that, were these agents to meet together daily, and compare notes, they could tell almost to an hour how many cattle would arrive on any given day. Having arrived in the out-skirts of the town with his cattle, the grazier or the manager puts them under the control of the agent, giving the necessary attendance until they are sold. The agent is henceforward, and from the beginning, the only man known to the butcher or the grazier. The recognized go-between-both. He gets from the grazier one dollar a head for selling, but the *countryman*, in this protracted business, is not yet done paying—another paring is to be taken off of his apple—another class of employées is to be supported. The collector of the agent's bills against the butchers, is to be paid a commission of *one per cent.* by the grazier, when he comes to settle with his agent.—This is a business which could not so well be done by either grazier or agent, because these bills must be collected at the butchers' stalls, and it makes a separate business of itself. When collected, the proceeds are paid over, not to the grazier, who knows nothing of the butcher or collector, but to his only trustee, the selling agent. He deposits the amount in Bank—probably the "Butchers' and Drovers' Bank," and checks for the amount, or if, as is natural, the grazier, as soon as his cattle are sold, wishes to depart, the collector throws his note to the amount of his bills against the butchers into the bank, where it is discounted, another thin slice being taken from the countryman's apple in the shape of bank discount. These bank officers make another class of goers between the producer and the consumer, their pay being taken finally out of the former, in about the same enormous proportion that the landed interest pays over every other interest of society, because it either does not know it or knows not how, to redress itself.

The last of the Western cattle arrive in New-York about the 1st of August, when they are driven out of the market by the grass-fed herds of more neighboring regions. The cost of road-expenses of a drove of 100 head from Kentucky, is about $1500. Some of the latter droves come in on grass at a less expense, but, as before intimated, the decline or "drift" is greater than when fed on hay and corn, and the beef not so good.

Such is an outline of the cattle trade from the West to the East, varying of course, in its results, according to distance, state of the market, &c.

On this, the 20th May, the beef market of New-York is considered to be uncommonly lively—the best bullocks bringing an average of $58 a head, or a little above 7—about 7¼ a pound.—The supply has been for some weeks past, almost wholly from the West. The demand of this market is about 1300 head a week, or 70,000 a year.

We conclude this hasty sketch with the following quotation from a late Report on the American Provision Trade with England, supposing that the whole subject may possess some interest for our readers in both countries: and will only add that the common price of corn in Kentucky, is 75 cents a barrel of five bushels. It is not easy to discern all the effects of this noblest production of the earth, on questions of agricultural economy:

"It is natural that our Provision trade with America, after three years' working, should be fully developed. It is not quite so with regard to swine products. It was at first expected that bacon and hams would be sent forward freely. Such has not been the case, and the expectation of a trade cultivation in these articles is much abridged. A greater business was looked for in barreled pork, but the value of this article in America being nearly equivalent to that of Irish or Hambro', importations have been in a great measure precluded thereby; saying nothing about the disparity in quality, the American proving much inferior to the other two. However, there have been some good lots of Amer-

ican imported, and we must not take it as a security that, because little has been done in this article this year, an extensive business is not yet to be cultivated in it. Lard has become a staple article of commerce, both for culinary purposes and pressers' and soapers' uses. With respect to beef, there can be no mistaking American superiority. The imports this year have been of uniform good quality, and nothing is now inquired for, for ship stores, but American beef. It has been steady in price all the year, scarcely differing 5 per cent. in value. It is considered to be remunerative to the packer and exporter, as well as importer here; and the manufacture of it is now so well understood there, and has so gained confidence here, that there is no doubt of this article (equally with lard) becoming a staple article of commerce. Under a 21s. duty a trade in butter will not be cultivated; the fluctuations in this market, and the risk of it becoming grease, operate against it, but we are likely to have some extent in butter shipped as grease from the States, and an effort may be made to cultivate a butter trade from Canada. But there is a prejudice against it, and it is not likely either to be extensive or profitable. There is very little doubt about the trade in cheese becoming extensive and permanent. Some of the imports have been equal in quality to any made in England, and the ready sale this article has met with nearly all through the year, with the good prices lately obtained for it, say as high as 60s. per cwt., will tend to encourage the trade in it. A better knowledge of packing the cheese for the English market, so as to prevent loss in cutting out, is the principal thing wanted, and that will no doubt be gained in time. The imports of these articles this year have been, 14,831 tierces, 3,437 barrels, of beef; 7,713 barrels of pork; 10,471 barrels, 49,452 kegs, of lard; 5,322 casks, 43,702 boxes, of cheese. And the stocks now on hand are light of beef, pork, and cheese, but heavy of lard."

VIATOR.

DRILL HUSBANDRY IN DELAWARE:

ITS ECONOMY AND SUCCESS—THE AMERICAN AND ENGLISH DRILL—HUSSEY'S AND HUMPHREY'S REAPING-MACHINES.

WILMINGTON, May 16, 1846.

JOHN S. SKINNER, Esq.: After the very flattering opinion expressed by you to me the other day in New-York, of the improving state of Agriculture, and the general intelligence and success among the farmers of Newcastle County, compared with other sections of the Union you have so recently visited, I take great pleasure in forwarding to you for the FARMERS' LIBRARY some interesting facts which should be extensively known to the whole farming community, in relation to "*Drill Husbandry*" as practiced by several of our largest and most successful agriculturists in Delaware—members of our Society and Farmers' Club. The long use of the Drill in English and European Husbandry, you are aware, has been tardily adopted in the United States, where there is still greater need of *economizing time and money*, and (except for root-crops) we have but few and imperfect reports in our journals, of American success and practice in drilling crops of any kind.

In answer to a number of letters received by me, as late President of our Agricultural Society, and Messrs. Sawdon, Jones & Co. who have for years been in the full tide of successful experiment with the Drill, I proceed to inform you that two kinds of the Drill are known and used by these gentlemen—the first brought out from England by Mr. Francis Sawdon some ten or twelve years ago—is now manufactured by Mr. Groundsell of Chester, Pa. and cost from $90 to $100. The other, the American Drill, invented and patented by Mr. Moses Pennock, of Kennet Square, Chester Co. Pa. the inventor of the revolving rake, which costs about the same, and although varying somewhat in detail from the other, the principle is the same; each is driven by two horses, the carriage resting on an axle with two wheels; above is the reception box for the seed and concentrated manures or ashes, guano, poudrette, &c. which communicates with from 7 to 8 tubes or funnels through a hollow coulter through which the seed is regularly and evenly deposited and covered in the earth. The enclosed letter addressed to me from Mr. John Jones, of Greenbush, is fully confirmed in its statements by Messrs. Sawdon & Co. all eminent practical farmers of this County, and the inferences from their experience are—1st. That by the use of the Drill there is a great saving of seed per acre, from at least two to three pecks of wheat, five pecks with the Drill being considered ample; 2d. A greater amount of acres can be sown per day, more evenly covered, and thus materially lessening the cost of agricultural labor; 3d. That when the wheat *is gathered* the *product* is at least *one-fourth greater* than when *hand-sown*, after the old method; that it withstands the winter frosts better, is less liable to be spread or thrown out, and stands stronger and firmer—

thereby resisting the inroads upon it of the "Hessian fly," the great pest and destroyer of this valuable grain—all which facts are respectfully submitted on behalf of the Delaware friends of *"Drill Husbandry;"* and permit me to say and prophesy that upon fair trial they *will be corroborated* by our brother American farmers after having fully tested the Drill.

The attention of our farmers has been also directed to the utility and importance of the *"Reaping-Machine."* I can only say here, that both those of Hussey and McCormick are duly appreciated by our Newcastle County Farmers, and that the seed which Sawdon & Pennock's Drills *sow are, or will be, generally reaped* by Humphrey's and McCormick's Reaping Machines.

I will only add, in conclusion, that these Drilling-Machines will plant wheat, corn, rye, oats, barley and grass-seeds, with all the pulverized and concentrated manures at one and the same time.* Lime is best and most equally spread by the lime-cart invented and patented for the purpose, and familiar to your readers. The subjoined letter of Maj. Jones goes more into detail, and is valuable for the facts it contains.

Very truly and sincerely your friend,
JAS. W. THOMSON.

WHEATLAND, 12th May, 1846.

DEAR SIR: I frequently receive letters of inquiry from agriculturists residing in different sections of the Union, on the subject of the Drill, or Seed and Grain Planter. These inquiries generally are as to its utility, economy and mode of operation, and whether they could be so constructed that the concentrated manures, guano, poudrette, ashes or plaster, may be sowed with them at the same time of sowing the various kinds of grain, and also grass-seeds.

Presuming that you have received letters on the same subject, I take pleasure in giving you my opinion of its worth, so far as my experience goes; and you have within your reach much better authority—that of Francis Sawdon, who is justly regarded as the founder of the Drill Husbandry in this State, having imported a Drill from England some two years ago, and used it with great success ever since.

My own experience has been with the *American Drill*, or Seed and Grain Planter, (which is an improvement upon the Jethro Tull Drill,) made and patented by Moses Pennock in 1841. I have used it for sowing five crops of wheat, three of oats, and three of corn. As it is now made, it is not adapted to sowing grass-seeds, or plaster, or any of the manures. The rollers are pierced for sowing turnip-seed, but I have not used them for that purpose. As the Drills are now fixed, they may be easily regulated so as to sow from one bushel of wheat or oats to two bushels to the acre. Ten acres' sowing may be regarded as a good average day's work. I have on one occasion sown eighteen acres, but the rows were long and land well prepared, and men and horses active. I generally drive two horses—some drive three—when sowing either wheat or oats. Pennock's machine sows 7 rows, each 9 inches apart. The outside drills, being 4 feet 6 inches asunder, are used for planting corn. To prepare for corn, after we have flushed and *harrowed the ground well,** we run a furrow or horse-path every 9 feet, in which the horse (one is enough for planting corn) walks, drawing the Drill after him, and planting two rows at a trip, dropping about a quarter of a bushel per acre. I try to thin this out, so that it stands at about one foot apart, one stalk in the hill, giving at that rate about $4\frac{1}{2}$ superficial feet to each stalk in the field, and each stalk separate and not choked up by another of its kind. The oats and corn pass through the same holes in the roller. The wheat roller or holes would do for rye also. I plow, harrow, and sow, always lengthwise of the land.

I believe the wheat crop has been increased at least twenty-five per cent. where the Drill has been used. The measurement of the lots of Doctor C. Noble shows a greater result I assisted in the measurement of those lots, and I think the account may be regarded as an average result, as given in the wheat crop. For particulars see the letter of Dr. C. Noble, as published in Mr. Ellsworth's Report, which in part is as follows: One acre sown broadcast, 2 bushels to the acre, yield $27\frac{1}{2}$ bushels; one acre drilled, $1\frac{1}{4}$ bushel seed per acre, yielded 35 bushels per acre—difference in favor of the Drill, 8 bushels. Add a quarter of a bushel saved by drilling or in seed, and we have eight bushels and one peck per acre in favor of the Drill.

It is true, both of those lots of land were good, the land well prepared, and the seed well put in [as every good farmer's will be]. *I believe that thin lands put in with the Drill* will produce corresponding results in favor of the Drill. I have not proved those results by measurement on my own land; the reason why, is because it was *poor*, and I did not wish to show the poverty of my poor old, worn-out farm.

As the best evidence I can offer of the utility of the Drill, our keen, cautious farmers have watched the wheat as it grew, after the two first Drills used by Mr. Sawdon and myself, and have so far become satisfied with the results that Drills have been purchased in St. George's

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* Not "as now made." See next letter.

* Here is one evidence of the thorough manner in which these Delawarians do their work: *"After we have flushed and harrowed the ground well"*—young farmers, *do hear that!* [*Ed. Farm. Lib.*

Hundred alone within the last ten months, some of which put in over 300 acres last fall, and several others are now engaged to be ready for August next.

Some of the other Hundreds of Newcastle County are preparing to use them in a corresponding ratio.

I will close this and leave Mr. Groundsell, Mr. Pennock, and Mr. Carr (who I understand has sent to England for the best improved Drill—*success to his enterprise)*—and also Mr. Sawdon, to give their views.

Very respectfully your friend.
J. JONES.

Dr. J. W. Thompson, Wilmington, Del.

I am not certain if one bushel of seed wheat or oats is not thick enough. Last year I sowed nine gallons of wheat and less of oats per acre.
J. JONES.

THE FARMERS' LIBRARY AND MONTHLY JOURNAL OF AGRICULTURE.

CLOSE OF THE FIRST VOLUME—COMMENCEMENT OF THE SECOND.

If Editor and Publishers have had the good fortune to redeem their promises, and meet the expectation of their patrons so far, they venture to hope that the Second Volume will give yet more satisfaction.

Every farmer can understand that no one can manage an estate the first year he comes into possession with so much efficiency as he can afterward. It requires a year at least to get acquainted with the nature of the soil, and the resources and wants of the farm: how much stock he can venture to keep—what implements are needed, and how he shall adapt his force to his work; for the work to be undertaken will depend on the capital at his command, and the crops to be grown; and these again will be regulated by the nature of the markets, which, to be remunerating or otherwise, will depend on distance, modes of conveyance, and other considerations.

So has it been with us. True, the Editor had no little experience in the conduct of agricultural journals, for, to think and to write about what might best elevate and promote American Husbandry, may be said to have been the passion and the habit of his life; but heretofore his labors and illustrations had been connected rather with the practice than the philosophy—with the A, B, C, than with the grammar of the art. When we undertook to edit and publish an agricultural periodical, devoted to "Agriculture, Internal Improvements, and Rural and Domestic Economy," no such thing had ever before been attempted in the United States.—Then it was most important, as it is still important, to make known generally, and as soon as possible, all existing practical improvements in the art, and the machinery and processes employed in it; and to shadow forth such as might yet be accomplished for its benefit.

The first object was to infuse an *esprit du corps* into the agricultural community, to get them to *think* and to feel that they too had a great business peculiarly and exclusively their own; one as susceptible, at least, as any other, of *melioration and progress!*—that they, too, needed a medium through which they could hold communion with each other, and promote their common interests by a free and reciprocal communication of thought and experience.

In the heartfelt conviction that such a great public convenience and instrument of public usefulness ought to be provided for and encouraged, the old "American Farmer" was established, without concert or promise of anybody's countenance. The issue proved that the founder was not mistaken—that the fruit was indeed ripe, and waiting to be plucked. The work was welcomed and supported by the *elite* of the *country* in every State. Then soon followed the "Plow-Boy," at Albany; then the "New-England Farmer," by the talented Fessenden; and the "Cultivator," established by the New-York Agricultural Society, and on its account at first, and soon and long after for his own, edited by the able and lamented Buel.—"Even in their ashes live their wonted fires!"

Now there are very many agricultural journals, conducted with eminent diligence and ability, which have served to spread abroad, through the agricultural community, a spirit of inquiry and a habit of reading, on the greatest, and, in its kindred sciences and literature, the most various and entertaining field of study that ever has been spread out before the mind of man. Thus it is, pioneer publications have cleared the way and opened the forest, until, in the present condition and wants of Agriculture, a new epoch has arisen; one which seems to create or rather to constitute the same demand now, for a journal more voluminous and elaborate, as twenty-six years ago seemed, in like manner, to call for a register of agricultural experiments, and advertisement of improvements

then actually achieved : and hence, now the establishment in this great emporium of enterprise, of the FARMERS' LIBRARY AND MONTHLY JOURNAL OF AGRICULTURE; which, though it contains more than five times the quantity of matter that the old American Farmer did, and is published in a style incomparably superior, is nevertheless, in keeping with other things, published at the same price ; to wit, $5 a year, or 5 copies for $20.

This is a work intended to explain the philosophy and the rights of Agriculture, as well as to illustrate all improvements in its practice and its machinery—a work which, we make bold to say, shall *deserve* to be supported by *every friend of the agricultural interest in the Union.* Very far from detracting from, or grudging success to, cheaper journals, dedicated to the same interest, unbounded success is heartily wished to them all. In fact, they but create a laudable desire for more and more of the knowledge they im part, and prepare the public taste for works more elaborate and expensive, just as common schools are the indispensable nurseries of a university. They but create and aggravate the thirst which this work, with its hundred pages monthly, is intended to slake.

To all our cotemporaries and allies we cordially extend the hand and the heart of fellowship and good will, except one—yes, there is one rival, whose meanness we detest, though we dare not despise his power. Powerful as the eagle—fit emblem of his own laziness and rapacity—he has lain in wait, while we poor individual Editors and Proprietors have opened the ground and overcome all difficulties; and now that we have made a despised cause popular, and provided food for the hungry and the destitute, he, in a spirit of envy and against every principle of common justice and honesty, filches us of our hard earnings, and, without stint or scruple, appropriates our labors to himself. Yes, reader—tell it not in Gath! publish it not in the streets of Askelon!—but that rival agricultural Editor is no other than "UNCLE SAM" himself! There he sits picking himself like a lazy bird in his eyry—as Dr. Franklin said of the eagle—while we poor Editors, on our own hook, catch the fish ; when he darts upon us in the ruthless exercise of his power, and snatches them—to be distributed, not in equal portions, share and share alike, to the whole family of birds, but exclusively to *his own pets.* Beginning with a legitimate and unpretending *List of Patents* granted through the year, he now comes out with a great *Agricultural Annual,* under the title of "THE PATENT-OFFICE REPORT"! and even that not fairly made up of original matter and new discoveries, with engravings for the benefit of inventors and the public, but a compilation, tame and unscrupulous, from the agricultural periodicals of the day. Seizing, in the plenitude of his power—since he cannot be sued—on our materials, he prints them on Government paper, at the Government press, and at the expense, not of those to whom he gives them, but of ingenious and, for the most part, poor and useful inventors—and sends them free by the Government mail. It must, therefore, be admitted that this all-powerful rival has great advantages over all other Editors, whose materials he thus appropriates to himself; but, then, it is not to be doubted that, if he possess a particle of common honesty, he, like any respectable builder, will make an equitable appropriation for each of the individuals from whom he gets his materials.

Even in war, though the officer, dressed out in his life authority, may *press* the farmer's, wagon and team, the public would cry, Shame! if he had not the decency to offer pay for them! Nor is it to be expected that Congress will fail at least to put other agricultural periodicals on something like a fair footing, by at least sending *them, too, in the public mail, free of postage.*

Why should Uncle Sam direct this flagrant and unconstitutional abuse of his power against the proprietors of *agricultural papers* exclusively? Why does he not set up his newspaper, his religious paper, his medical repository, and his law reporters? Why not set up the business of type-founding, engraving, paper-making, and all other arts, trades and manufactures?—Why, in a word, should not the subscribers to the *American Farmer, Southern Planter, Southern Cultivator, Albany Cultivator, American Agriculturist, Ohio Cultivator, New-England Farmer, Maine Farmer, Farmers' Monthly Visiter, Boston Cultivator, Massachusetts Plowman, American Quarterly Review, New Genesee Farmer, Farmers' Cabinet, Lancaster County Farmer, North Carolina Farmer, Southern Agriculturist, Alabama Planter, Planters' Banner, Nashville Agriculturist, Dollar Farmer, Indiana Farmer, Prairie Farmer,* and the *Michigan Farmer*—why have they not as much right to have their papers sent to them free of postage, at least, if not subscription, as the chosen favorites (mostly rich men or politicians of *both* parties), to whom this Government Annual is sent, thus entirely free of cost?—as much as to say to the community, Don't give a *sous* to these fellows; let them work for nothing and find themselves, and UNCLE SAM, in the fullness of his power, and his own latitude of construction, will lay by and seize upon the fruits of their labor when they are gathered in, all ripe, and, culling the choicest from their baskets for you, will leave the refuse for those who *are fools enough to pay for it!*

After all, it may be demanded, whence is derived the power to build up this new branch of

the Government? and who shall guaranty to what purpose it may not be abused? When did men ever possess the chance to exercise power for selfish ends, with impunity, that they failed to do it? Are they less prone to do so when banded into *parties?*—we care not what party—political or religious? Who will guaranty how long it will be before this new function—this Editorial office—will begin to insinuate party doctrines, and favoritism or hostility to particular institutions and branches of industry, *under the guise of benefiting Agriculture?*—And is this the only boon to be offered to the landed interest, like a tub to the whale, to divert it from the recollection of the *millions it* has paid and the millions *it* is yet to pay for the military machinery of the Government?—for the hundreds of thousands paid annually for military schools—for the more than $100,000 to be paid this year for military surveys and maps? If Uncle Sam can set up his periodical for the benefit of Agriculture, why not construct free roads, and build free bridges, and manufacture poudrette, for its benefit? and illustrate its philosophy by chemical experiments? Would not all these things, too, benefit and enlighten Agriculture? Truly, he would make a formidable rival in any branch of business; but in this of publishing a periodical, with materials taken annually from individual proprietors, let him beware that, in experimenting to see on how little they can live and yet work, he does not serve them as the Frenchman did his horse. And how, then, will he get along with *his* great free agricultural periodical—free *at the cost of poor inventors!*

EDITOR FARMERS' LIBRARY.

May 22, 1846.

Since writing the above, we have been favored with the loan, only for a few minutes, of the last "Annual Report of the Commissioner of Patents," and *Inspector General of Agriculture.* The Commissioner's part of it, it is clear enough, from the little we have seen, is written with a clearness and force, and a high appreciation of the importance of Agriculture which does him much credit. We complain not of him, nor of any of his accomplished and diligent associates, some of whom, it is earnestly and honorably urged by the Commissioner, are so meanly compensated as to show that at Washington salaries are too often graduated with utter disregard of the talents required for a proper discharge of the office. This report of the *Patent* Office consists of 1184 pages, of which *nearly eleven hundred are composed of agricultural items!* collected and made up chiefly of the cream of agricultural papers.

The Commissioner says, "The sum now annually appropriated for agricultural purposes is taken from the Patent Fund, *all of which has been paid* into the Treasury *by inventors*, and which has been set apart by law for the promotion of the useful arts and for the benefit of that class of citizens *from whom it has been collected.* They *justly* complain (says the Commissioner) of this *mis*application of the Patent Fund, and demand that it shall be appropriated to the increase of the efficiency of the *Patent-Office*"—and, we add, or else the expense of obtaining patents should be abated to that amount, and the inventive genius of the country be unfettered and brought into yet fuller and freer play.

For what has been done in the way of applications for *agricultural* inventions we have turned, as we always do, with interest to the Report of the accomplished examiner. Doctor PAGE, who says briefly, not multiplying words where there is no need of it:

"Number of applications 133—number of patents granted 48.

"But little novelty has been presented to the office in the way of agricultural implements; and although the subject is one of fast growing interest and value, and has received some rich contributions from chemists and philosophers, yet those branches usually coming before the office have not received as many accessions as in former years. Some improvements have been made in plows, particularly wheel-plows; several new devices have been patented, and one new and apparently valuable invention for adapting the set and draught of the plow in a ready manner, so as to take more or less land, at pleasure.

"The *bee-hive* has been the subject of much attention—many of the hives presented, exhibiting only changes of form, without the attainment of any new principle in bee management. It is believed that no effectual means have yet been discovered of preventing the ravages of the bee moth, independent of constant personal attention; although several of the inventions patented for this purpose will doubtless, to a considerable extent, diminish the evil. In spite of all the artifices to decoy the moth into traps and to deposit its eggs where the grub will be so remote from the entrance to the hive as to perish in the attempt to reach the comb, this insect retains enough of his instinct to enter as it is wont, with the bee, and deposit its eggs directly in the comb, even in the uppermost part of the hive. As the moth exists only at certain seasons, and does its work only at night, it follows that the entire enclosure of the hive at night will exclude the enemy with certainty. For this purpose the hives are sometimes arranged under a tightly jointed house, provided with ventilated doors of wire gauze, which are shut regularly at night and opened early in the morning. The objections to this plan are, the expense of the fixture and the unfailing attention required to open and close the doors; for a single act of neglect in this duty might result in the destruction of the hives. A curious invention has been patented, worthy of mention in this connection. The patent was granted for combining a henroost in such manner with the door of the hive that the weight of the fowls going to roost would operate, through the medium of levers and pulley, to close the door of the hive, and the door opened by reverse action in the morning when the fowls leave the roost. If, as the inventor

asserts, he can depend upon a certain number of his fowls retiring and rising with the bees, it will prove a valuable labor-saving invention."

We shall, when we can procure a copy of this Patent Office Agricultural Report, use such matter as we can find—which has not been transferred from our associates—when it may seem to be of importance to the great interest to which they and we are giving all our time and attention, with so much labor and *at so much expense*

MAIZE, OR INDIAN CORN.

THIS important and valuable plant is of the genus *Zea Mays*, from *Zao*, to live, in reference to the nutritive properties of the plants belonging to the genus. The French name, *Blé de Turkie*; the Spanish, *Trigo de Indias*; the Italian, *Grano Turco a Siciliano*; the German, *Turkische korn Mays*.

America is doubtless the native country of a plant so important to her interests; and it is supposed to be indigenous to South America, being the only species of grain cultivated in the New World previous to its discovery by Europeans. It was found in use by the natives of the West Indies, when they were first visited by Columbus. Notwithstanding this well-established fact, the origin of maize has been a disputed point; and several early European writers maintained that it came from the East. Varieties of the plant, it is said, have been brought from the Isle of France or from China. In favor of its American origin, however, is the fact that it was found in a state of cultivation in every place where the first navigators landed. In Mexico, according to Hernandez, and in Brazil, according to Zeri, and that in the various countries it had proper names, such as *Maize*, *Flareli*, &c., while in the Old World, its names were either all of American origin, whence it was derived. Immediately after the discovery of America, it was spread rapidly in the Old World, and soon became common—a fact not reconcilable with its former existence there.

To these proofs, Aug. de Saint Hiliare has added another. He has received from M. de Larranghu, of Montevideo, a new variety of maize, distinguished by the name of *Tunicata*; because, instead of having the grains naked, they are entirely covered by the glumes. This variety is from Paraguay, where it is cultivated by the Guaycurus Indians, a people in the lowest scale of civilization; and where, according to the direct testimony of one of them, it grows in the humid forests, as a native production.*

The early authors who have written about America, with few if any exceptions, mention maize as an indigenous grain. Thus Acoste, who died in his 60th year, in 1600, at Salamanca, in Spain, calls it "Indian wheat to make bread of," and says "that it was the only grain found in the West Indies by the Europeans—that it grows upon a long reed with large grains, and sometimes two ears on a reed, on one of which 700 grains have been told—that they sow it grain by grain and not scattering, as is done with wheat; and it requires a hot and moist soil. There are two sorts of it, (says this author), one large and substantial, the other small and dry, which they call "*moroche*." The leaves of it, and also the reed are very good for cattle, green, and dry, it serves as well as straw. The grain is better for beasts than barley. The Indians eat it hot, boiled, and call it "*moté*." There is a sort of it large and round, which the Spaniards eat toasted; they also grind it and make cakes, which they eat hot, and these, in some places, they call '*arepas*.' They also make bread, to keep, and sweet-cakes of it."

Maize is now extensively cultivated in Asia, Africa, and the South of Europe. On all the shores of the Mediterranean—Spain, Italy, and the countries of the Levant—it supplies a considerable portion of the food in most common use. Large quantities are raised in the valley of the Danube and other rivers which flow into the Black Sea, and exported thence to various parts of Europe. The region of the maize in Europe seems to have been extending northward. It is grown in France, Germany, and even in the Netherlands. The last, however, is somewhat beyond the true region of the maize, which requires the warmer summer of the South of Europe to bring it to its full perfection. The best kinds suited to the colder climates are the Dwarf, some of which, even in the latitude of Paris, complete the circle of their vegetation in a period comparatively short.

In America, maize flourishes from 40° of south latitude to about 45° north latitude. Of the cultivated *zea mais*, naturalists hold that there is but one species. The varieties of the species cultivated in the United States are very numerous. A list embracing many of these has

* Johnston's Farmers' Encyclopædia.

been furnished by P. A. Brown, Esq. in an interesting essay on Indian corn. (See *Farmer's Cabinet*, vol. 2.) It is an interesting fact that the rows of grain on a cob, however numerous or limited, always present even numbers.

CROP OF INDIAN CORN IN THE U. STATES.

We now present the following Table of the quantity of Maize or Indian Corn raised in each of the United States and Territories in the year 1839, according to the Census of 1840; to which we add the value of the same in each section, as estimated by Professor Tucker:

States.	*Bushels.*	*Value.*
NEW-ENGLAND STATES.		
Maine	950,528	$712,896
New-Hampshire	1,162,572	796,626
Vermont	1,119,678	746,652
Massachusetts	1,809,192	1,356,894
Rhode Island	450,498	281,561
Connecticut	1,500,441	900,264
Total New-England	6,992,909	$4,794,893
MIDDLE STATES.		
New-York	10,972,286	$6,857,699
New-Jersey	4,361,975	2,617,175
Pennsylvania	14,240,022	8,544,013
Delaware	2,099,359	1,259,615
Maryland	8,233,086	4,058,271
Dist. of Columbia	39,485	19,742
Total Middle States	39,946,213	$23,356,515
SOUTHERN STATES.		
Virginia	34,577,591	$17,288 795
North Carolina	23,893,763	9,477,505
South Carolina	14,722,805	7,361,402
Georgia	20,905,122	10,462,561
Florida	898,974	404,243
Total Southern States	94,998,255	$44,994,506
SOUTH-WESTERN STATES.		
Alabama	20,947,004	$8,378,801
Mississippi	13,161,237	5,264,494
Louisiana	5,952,912	2,976,451
Arkansas	4,846,632	2,423,316
Tennessee	44,986,188	11,246,547
Kentucky	39,847,120	7,969,424
Total S. West. States	129,741,093	$38,259,033
NORTH-WESTERN STATES.		
Ohio	33,668,144	$6,733,629
Indiana	28,155,887	5,631,177
Illinois	22,634,211	4,526,842
Missouri	17,332,524	3,482,505
Michigan	2,277,039	455,408
Wisconsin Ter.	379,359	75,872
Iowa Ter.	1,406,241	281,248
Total N. West. States	105,853,405	$21,186,681
RECAPITULATION.		
New-England States	6,992,909	$4,794,893
Middle States	39,946,213	23,356,515
Southern States	94,998,255	44,994,506
South-Western States	129,741,093	38,259,033
North-Western States	105,853,405	21,186,681
Total United States	377,531,875	$132,591,628

The average value per bushel for the United States is about 35 cents.

The blades or stalks of Indian corn, as is well known, form an excellent fodder for horses and cattle; and which, estimating twenty pounds for every bushel of grain, amounts to 3,775,000 tons—worth, by Professor Tucker's estimate, $37,750,000.

Thus, the value of the crop of Indian corn in the United States may be stated to exceed *one hundred and seventy millions* of dollars, and greatly exceeding the value of any other crop raised in the country.

THE HARROW.

NEXT in antiquity and usefulness to the plow, in the implements of Agriculture, is the harrow. This instrument, in some rude form or other, must have existed from a very early period. For, as the preparation of the ground for the reception of the seed required one kind of implement, so the covering of the seed with the loosened soil, required another of a different form. The first and most readily found harrow was, probably, merely the branch of a tree; even so late as 1668, Gervas Markham, in his "Farewell to Husbandry," p. 61, gives a wood engraving of a harrow, the directions for the manufacture of which he thus states: "Get a pretty big white-thorn tree, which we call the hawthorn tree, and make sure that it be wonderful thick, bushy, and rough grown." The natives of some parts of India, in fact, still use no other instrument. It was a farther improvement to construct a wooden harrow by fastening together the branches of the fir-tree, leaving their partially removed spurs to serve as teeth. The peasants of some portions of Russia still employ such a harrow. The joining together of wooden frames without teeth, as in the *Haken* of the Belgian farmers, was a later improvement—then came the addition of wooden teeth, next the use of iron teeth with wooden frames, and, lastly, the construction of most descriptions of harrows entirely of iron.

This instrument, indeed, succeeds to the plow in the natural order of description, and in the uses to which it is applicable. Its purposes are to pulverize the ground which has been moved by the plow, to disengage from it the weeds and roots which it may contain, or to cover the seeds of the cultivated plants, when sown. The form of the plow, as before shown, has been very different in different ages and countries, and there is little resemblance between the rude machines of the ancients and some of those which are now employed; but the harrow seems to have been nearly of the same form from the earliest times to which we are able to trace it on sculptures, medals, and other remains of antiquity. It is, in fact, a much more simple machine than the plow; yet it is an instrument of great utility in tillage, and, with one exception

hereafter noticed, no other has yet been devised to supersede its use, or to equal it, for many of the purposes to which it is applicable. (*Quart. Jour. of Agr.* vol. i. p. 503.)

Important as is the operation of harrowing, and second only to that of plowing, it has often appeared to me that these implements have scarcely obtained the attention which is their due. I here speak less with reference to the improvements which have been carried into effect, than to the selection which appears generally to have been made. The operation is in many neighborhoods so performed as to exhibit a prominent defect, either in the management of the farm, or in the construction of the implement.

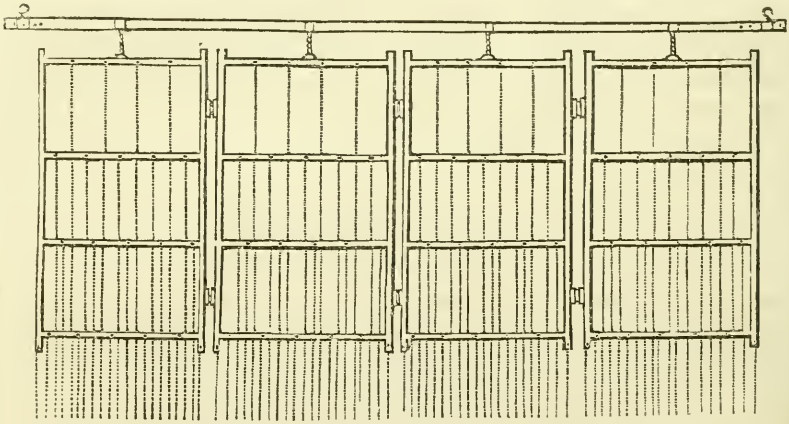
Perhaps the blame may here be fairly shared. It is admitted by all acquainted with the subject, that harrowing, especially on heavy soils, is the most laborious operation on the farm; not so much, perhaps, on account of the quantum of power requisite for the draught (though this is sometimes considerable), as for the speed with which the operation is, or ought to be, accompanied; and yet it is frequently left to the charge of mere boys, and sometimes performed by the worst horses on the farm.

If we examine a field, one-half of which has been harrowed with weak, inefficient horses, and whose pace was consequently sluggish—the other half with an adequate strength and swiftness of animal power—we shall find the former will be rough and unfinished; the latter comparatively firm and level, and completed in what would be called a husbandry-like manner.—Scarcely anything in farming is more unsightly than the wavy, serpentine traces of inefficient harrowing. The generality of harrows appear too heavy and clumsy to admit of that dispatch without which the work cannot be well done; and, though it is evident that different soils demand implements of proportionate weight and power, yet, for the most part, harrows have been rather over than under weighted, particularly when employed after a drill, or to bury seeds of any kind.

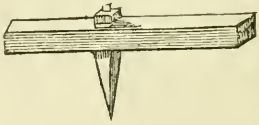
Harrowing has been so long regarded as an operation which must be attended with considerable horse-labor, that attention does not appear to have been sufficiently turned to the inquiry whether this labor might not be greatly reduced by lightening the instruments with which it is performed. Many would be surprised at the amount of reduction of which seed harrows, at least, are capable; and, where land is clean, to see how effectively a gang of very light, small-toothed harrows may be used.

Having noticed, in some parts of Norfolk, the perfect manner in which seed-corn is covered by a common rake with wooden teeth, a friend of mine constructed a gang of harrows on the following plan, and he states that it proved the most popular and useful implement of the kind to the farm.

GANG OF LIGHT SEED HARROWS.



The frames are of ash, and as light as possible, with iron teeth being but three inches long, exclusive of the part which enters the woodwork. They screw into the balks in the manner shown in the annexed figure.

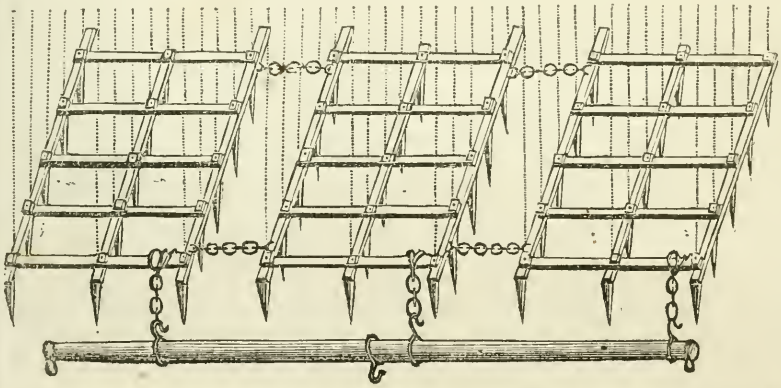


It should be observed that the above four harrows are amply sufficient to cover a twelve-furrow stetch or ridge of 108 inches, but three will be wide enough for a three-furrow stetch of 90 inches, exclusive of a small portion of the furrows. If for some purposes the teeth be found too thick, every alternate tooth may be taken out; but for general purposes this will hardly be necessary. The two horses require, on this plan, to be kept quite level; for, if one be suffered to go in advance of the other, a diagonal line is produced, by which the teeth will be made to follow each other, instead of cutting fresh ground. I am aware that, by the usual construction of harrows, a diagonal line of draught is required, in order to throw the teeth into a proper working position; but I am strongly inclined to the opinion that the correct working of the implement ought to depend on its construction, and not on any particular mode of working it. Besides, the system of keeping one

horse in advance of his partner is bad in principle; it is an unequal division of labor, the fore-horse being compelled to do more than his share of the work, which, under any circumstances, is always heavy enough. The balks of the above set of harrows were made of wood in order to ensure extraordinary lightness; but, for general purposes, I prefer those made of iron, the weight of which can be increased to any reasonable degree without adding much to their substance. This is important in working tenacious clays, which, by adhering to the common clumsy wooden balks considerably increase the labor, and at the same time impede the proper execution.

In an experiment made between a pair of wooden harrows and a pair of iron ones, constructed on the same plan, having the same number, and precisely the same disposition of the teeth and frames, although those of iron were found to be 20 lbs. lighter than those of wood, yet the former worked decidedly better and steadier than the latter; in fact, the iron harrows cut into the land, while those made of wood rode, or rather danced, on the surface.—Next, as to the length and position of harrow-teeth. The common plan is to set them springing a little forward, and gradually increasing in length from the fore to the hind row. There is no advantage in this, but the contrary; for, if the action of harrows so constructed be carefully examined, it will be found the reverse of what it ought to be—the hind part will be thrown up, and the fore teeth, short as they are, will have to do all the work. In some experiments made with harrows, the fallacy of the idea, that an inequality in the length of the teeth was essential to the proper working of harrows, was made evident. For this purpose, a harrow constructed on the old-fashioned plan of unequal and springing teeth, was reversed, putting the longest teeth in front; the whole of the teeth then pointing *backward* instead of *forward*. Nothing could work better; there were no chucks and snatches, but all went on smoothly and steadily. I do not, from this circumstance, recommend harrows to be so constructed, but have no doubt that each harrow should have all its teeth of equal length, and they should stand perpendicularly from the frames.

GANG OF HEAVY IRON HARROWS.



The above engraving of iron harrows is introduced to show the form in which they are usually made; they are used in gangs of three, four, or five, as may be required to suit the lands on which they are used, and may be made to any weight required.

[Ransome's "Implements of Agriculture"

THE MAKING AND USE OF CAPONS.

FRENCH METHOD OF FATTENING FOWLS.

Is it not unaccountable, Mr. Editor, that in this age, which has acquired the name of *utilitarian*, such slow progress should be made in the practice and economy of *making, using and eating Capons?* In a certain County in Maryland, where the writer first "saw the light," one faithful old woman slave of his grandmother possessed the art of caponizing fowls; but with her, alas! the secret expired. Even with her, it was only put in use so far as to provide a parent who could carry about and protect from the weather a double brood of young ones, leaving the natural mothers to return to the work of procreation, after having been shut up a few days, just long enough to dry up their tears and forget that they had been robbed of their progeny—the process of oblivion being as short-lived with some two-legged mothers, as with "other some."

This reference, by-the-by, Mr. Editor, to my old grandmother's negro capon-maker is one of the writer's most youthful reminiscences of dear old *Calvert County* in Maryland.

Ah, happy hills! ah, pleasing shade!
Ah, fields beloved in vain!
Where once my careless childhood strayed,
A stranger yet to pain!

We can just remember when her party feuds, beginning on account of devotion to certain distinctive principles of government, but, alas, too soon degenerating into devotion to—other things; when her Kents and her Taneys, her Fitzjameses, and her Roderick Dhus, headed each his clan, and fought as for life or death; but, in the hottest of their contests for principle, both would have united, by a sort of moral crystalization, to heap infamy on any one who should have dared to advocate repud—no! sir; no! I will not write the shameful word as connected with old Calvert County, where once lived a race of gentlemen of as good manners and high honor as any that ever "trod shoe-leather!" but *revenons a nos Capons!*

The great value of the art, as it is exercised in Paris, and in a *few* places in the United States, consists in its effect in disposing the fowl to *fatten* more quickly and more perfectly, and in its tendency to improve the flavor, as every one will tell you who has eaten fat Capons in Paris or elsewhere.

"He hath bid me to a calf's-head and *capon*."

In Philadelphia, too, Capons are getting more into vogue. In New-Orleans, among the Creoles—honest, quiet, hospitable good-livers and brave people, who know "what 's what"—they have a genius both for making and for eating Capons.

At the table of Col. H. near Columbia, I have lately something more than *seen* them, in the greatest perfection; and in his poultry-yard, which includes acres, and is "a sight to see," you may see not only the barn-door fowl, but *turkeys* also, that have been caponized. His gardener performs the operation with infallible success, going about it in the simplest manner, and putting aside as useless the instruments we have seen figured in agricultural papers, as complicated and polished as if they were intended for the most critical and delicate of all surgical performances. His poultry-yard sometimes contains more than 500 chickens, purchased by him from his own slaves, at a fair market price, after being fed and fattened on his own corn, of which last year he made *only* 25,000 bushels!

As, according to all accounts, the table of the Parisian epicure is for nothing more distinguished than for the excellent *quality* of the poultry, and the art with which it is cooked, (roasted with cresses, not a bad way,) I have supposed that you might be inclined to give place to the following description of the French Method of Fattening Poultry, as laid down in a late number of the "*Journal d'Agriculture Pratique et de Jardinage.*" Will the reader who may amuse himself by making the experiment, substituting Indian corn for barley meal, be good enough to communicate the result to the Farmers' Library? Small things are not to be despised, for it is of such things, in a great measure, that the world is made up. Besides, we have good authority for asserting the meliorating influence of emasculation on the flavor of meat; for you recollect the great inspired Psalmist says it is only "*If* I were *hungry* I will eat the flesh of *bulls*, and drink the blood of *goats*;" and why not apply the same condition to poultry?

FRENCH METHOD OF FATTENING POULTRY.

The fowls to be fatted are placed in boxes 1½ foot square or more, frequently in second-hand barrels provided with rude wicker-work tops, which are kept covered with mats to exclude the light. The barrels are half filled with clean straw, and will each accommodate four fowls; the straw to be removed from time to time, as cleanliness may require.

The chickens are to be fed three times a day—at six in the morning, at noon, and at 8 at night—on the following mixture: 5½ oz. of barley meal (Indian meal might be as good), and the third of a pint of sweet milk, *warmed*. This is the allowance for each fowl; but as it is essential that the food should be warm, it must be prepared at each feeding.

To administer this broth to the fowls, a small funnel is requisite. The chicken is taken from the barrel with the left hand, its feet are placed upon a mat and are secured there by the pressure of the operator's left foot, which had better be unshod for the purpose; the head is held firmly in the left hand, the bill held open with the thumb and fore finger, the funnel introduced and the food poured in it with the right hand. This done, return the fowl to another barrel (it is most convenient to have duplicate barrels), in which the straw has been renewed. One person, accustomed to it, can *feed fifty fowls in an hour*. The milk may be substituted by lard and warm water, but the fowls do not look so white.

It is better the first day not to give more than a third of a full allowance, the next day half, and the third day a full ration. Some of the larger fowls may require more, but this may readily be ascertained by the crop.

The time required to fatten a pullet is from 18 to 20 days—average 18. In this time she will gain in weight, if well fatted, 27 oz. having consumed in barley flour or meal 5 lbs. 10 oz., in milk 13 lbs. 6 oz.—in all, 19 lbs. of food.

The best age at which to fatten pullets is between ten weeks and three months. At six months they are tough. For a capon the best age is six months. A young hen lays the first year about 150 eggs, the second 120, the third 100—diminishing every year as she grows older and should "go to pot" after the fourth.

Balls for removing Grease and Paint Spots from Cloth, &c.—Fuller's earth, 30 parts; French chalk, 1 part; yellow soap, 20 parts; pearl-ash, 15 parts. Make into a paste with spirit of turpentine, and give it a slight color with a little yellow ochre, then cut it into cakes.

PREPARATION AND APPLICATION OF COMPOST.

OATLAND COTTAGE,
HEMPSTEAD, L. I. February 28, 1846.

DEAR SIR: I have received several communications by post, soliciting information respecting Farm Journals, and Decomposing Vegetable Substances in twelve or eighteen days, as referred to in your November Number, page 247.

In the first place, my working journal is too large to forward, and too long to transcribe, and your extract is a fair specimen of one page.

The method I have pursued for about seven years in decomposing trash of any sort for manures, is as follows: A layer of any rough stuff I can collect, one foot thick, on which I spread lime (purchased in New-York at 5 cents per bushel,*) about a quarter of an inch thick; then another layer of the first, then bone-dust about half as thick, and so on, alternately, till I make my heap as large as I want it, covering the heap with a mixture of fine charcoal and plaster about two inches thick. The charcoal costs me 4 cents a bushel, the plaster $1 12½ per barrel. The fine bone-dust can be procured of Mr. HORNBY, N.Y. and the charcoal of James Barling, Chemical Works, James st. N. Y.—the whole covered over with 6 inches of soil. In about 3 days fermentation takes place, and goes on rapidly, and will require wetting. Sticks forced in the heap for about 3 feet act as indexes. If getting very hot and dry I add as follows: For potatoes, a solution of potash, about 5 lbs. to a baarel of water; or, what is better, house slops, *all of which I save*, such as soap-suds, chamber-lye &c. This I apply by making holes about a foot apart in the heap, with a strong pointed stick, covering the holes up when applied. For usual garden purposes, 2 lbs. sulphate of ammonia to a barrel of same stuff. If for wheat, potash and sulphate of ammonia, half the quantity. Sometimes it requires melting twice. About the ninth or tenth day I break it up, and in a few days it is fit for use, and I have never failed in having it sufficiently fine to plow or spade in.

For many years it has been a common practice on Long Island, and perhaps elsewhere, to give land a dressing with leached ashes, when put down to grass, at the rate of from 6 to 10 loads of 14 bushels (89 to 144 bushels) each. For three years past I have adopted the following plan, which has saved both money and labor, with, I believe, equal success. One of my neighbors has tried it with rye this year, and speaks of it highly. To each load (say 30 bushels) of fine soil or sods, I add a layer of potash, 50 lbs.; then a layer of half as much soil, and a bushel of lime; and so on alternately, till I mix as much as I want. In a week turn it over—the potash will be pretty much dissolved—and in another week fit to use. To each acre, after the land is last plowed, I spread with a shovel 3 loads, containing about 150 lbs. potash, and harrow it in; then sow. I prefer it to ashes. The potash I procure at the Inspection Warehouse, N. Y. called scrapings, at about $3 per cwt.

In hope the above hasty remarks may be useful to some of your readers.

I remain yours, truly, JOHN HAROLD.

To J. S. SKINNER, Esq.

* This we suppose must be the refuse lime of kilns, delivered at the kilns. [*Ed. Farm. Lib.*

NEIGHBOR MANUFACTORIES:

THEIR CONVENIENCE AND UTILITY.—EXAMPLES IN MARYLAND.

WE have alluded elsewhere to the convenience of small neighborhood manufactories, for consuming the wool and supplying the cloth required for every County in the Southern States. Of such factories we have examples in the "Powder Mill" in Montgomery, and the "Paint Branch" Factory in Prince George's County, Maryland. The proprietors of these small, snug establishments, advertise in that useful and well-conducted paper, the Marlboro' Gazette, that they will keep on hand a general assortment of woolen goods, which they will exchange for wool, on reasonable terms; and they give notice of certain stores in Alexandria, Washington, Baltimore and certain other places in the neighboring Counties, where their woolen goods will be kept on hand, ready to be *exchanged for wool*, so that the farmer can either buy his cloth, at once, and pay for it with his wool, or have his wool manufactured for his own use, as he may prefer, and according to his own notion and purposes.

We feel persuaded that "*Chase's Card Spinner*" might be introduced with economy in all such establishments, as by it refuse cotton may be made to take, in part, the place of wool, which is more costly. The cotton thread is wrapped effectually in wool, and a cloth produced that, according to the samples we have seen, comes fully up, in the matter of firmness, strength, warmth and durability, to all that has been said in favor of this machine.

It is gratifying, at any rate, to know that for once a new invention which promises useful results to the agricultural community, is in the hands and under the control of a gentleman who is under no necessity and whom no necessity could prompt to mislead the public.

As to the particular manufactories to which we have alluded, we know nothing of their particular management; nor is the FARMERS' LIBRARY under any *special* obligation to consult the interests of *Maryland*, contrasting the little support it has received in that State with the much greater which has come from more distant ones. The proprietors refer, however, to gentlemen of the highest respectability. We instance these factories only to show that convenient neighborhood establishments, on a moderate scale, requiring, as we suppose, not much capital, do exist, and, as we believe, deserve to be recommended as the proper, legitimate successors of the old hand-looms, such as were in such common use in old times, and may still be seen along the country roads in the "Old North State." Well would it be, as we believe, if we could see such moderate establishments scattered over the whole country, drawing their materials for manufacture and subsistence each from its own neighborhood. Better than to have the whole business monopolized by one or two States, where overgrown works that cost millions of dollars monopolize the business, giving subsistence to thousands, and immense fortunes to one or two. Let us cherish systems that will best secure, not millions to a few, but competence to many—such as will best secure *independence*, as far as possible, not only to the nation, but to every State, and every County, and every neighborhood, for its food, clothing *and education*. The prices designated at these Maryland factories are—

Heavy fulled kerseys....	3-4 wide,	32	cts.	per	yd
Do. do. do.	6-4 "	64	"	"	
Heavy kerseys.....	5-4 "	25	"	"	
Plain linseys	5-4 "	25	"	"	
Striped linseys	5-4 "	30	"	"	
Twilled or plain flannels.	5-4 "	30	"	"	
Sup. blankets, all wool.	10-4 "	75	"	"	

All other goods in proportion to the above. All orders will be executed in the best manner, and the utmost punctuality observed in all their engagements.

The proprietors go on to designate the particular places at which they will attend, on given days, for "receiving wool, or taking orders."

What is to be observed, though it does not in the least surprise *us*, is such *exact agreement in all the prices*, between the two establishments.

How easy for the followers of other trades and occupations to come to these understandings! How difficult for farmers to do the same thing! The spiders in the center of their webs are always well advised of what is going on; their feelers ramify to every point of the compass. The poor flies are buzzing about here and there and every where, and never dream of danger until they are caught. In the affairs of mankind, who are the *spiders?*—who the *flies?*

OIL-CAKE.

Some of the Results of the Analysis of Oil-Cake by the Agricultural Chemical Association in Scotland.

1. That the per-centage of the protein compounds, in the analysis called gluten and albumen, is nearly equal to what is contained in peas and beans, and that, therefore, for the production of milk for the cheese-dairy, and also for laying on muscle, oil-cakes are as valuable as beans, peas, or clovers. This is a result somewhat unexpected, inasmuch as the value of oil-cakes in the feeding of stock has hitherto been supposed to depend very much upon their power of laying on fat: in other words, upon the per-centage of oil they contain.

2. The proportion of oil in these cakes is greater than is naturally present in any species of grain or pulse usually cultivated. Oats contain as a maximum about 7, and Indian corn about 9 per cent. of oil, but these cakes contain 12 per cent., and are, therefore, in their ability to supply fat to an animal, superior to any of our cultivated grains.

3. These oil-cakes leave six per cent. of ash, of which one-third consists of phosphoric acid: 100 lbs. of oil-cake, therefore, contain 2 lbs. of phosphoric acid. On the other hand, our common kinds of corn—wheat, for example—leave only two per cent. of ash, of which one-half consists of phosphoric acid, or 100 lbs. of wheat contain 1 lb. of phosphoric acid. *Therefore*, for laying on *bone*, or for supplying the materials of bone to growing stock, *oil-cake is twice as valuable as wheat*, weight for weight, and *more than twice as valuable as oats or barley* which are covered with a husk.

4. Again the same reasoning shows that, as grains of all kinds draw their phosphoric acid from the soil, these oily seeds will exhaust the soil of its phosphates to a much greater degree than our corn crops: 100 lbs. of linseed will carry off twice as much of them from the soil as 100 lbs. of wheat.

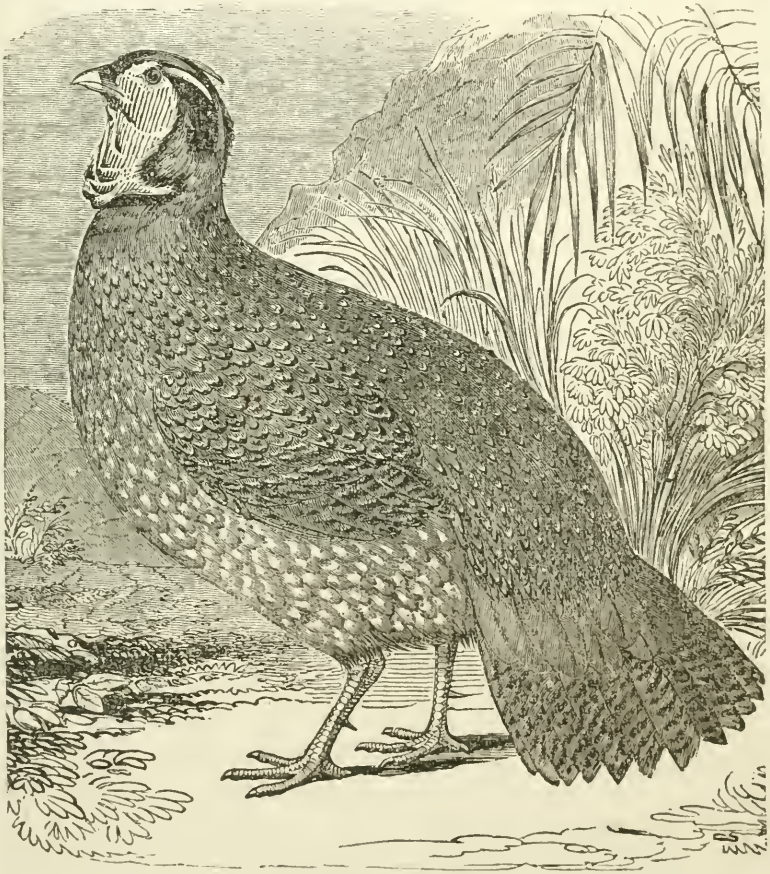
5. But the same circumstance supplies an additional reason why the manure of *full-grown* store stock fed upon oil-cake is so much richer than that obtained by the use of any other kind of food. It is richer,

(*a*). Because the proportion of the protein compounds (albumen, &c.) in the oil-cake is greater than the fattening animal can appropriate, and thus much of them passes off in a more or less changed state, and is mixed with the dung.

(*b*). The oil also is in larger proportion than can at times be laid on their bodies even by fattening stock, and this unquestionably contributes to the fertilizing quality of the manure.

(*c*). But the full-grown animal appropriates scarcely any of the *phosphates*—the whole of these therefore, which the animal consumes in its food, appears again in its dung. And the oil-cakes being richer in these phosphates weight for weight, than any kind of corn used for food, the dung thus made is also richer in these phosphates than that which is obtained from animals fed upon almost any other kind of food.

THE HORNED PHEASANTS OF THE HIGH MOUNTAINS OF INDIA.



[The Horned Pheasant.]

THE Pheasants *(Phasianidæ)* form one of the most interesting groups of the feathered race, whatever be the point of view in which we contemplate them. Their beauty of form and the splendor of their hues have attracted universal admiration. Many dazzle by the metallic lustre of their plumage, which gleams with green, and blue, and gold. Such, for example, is the case with that gorgeous bird, the Impeyan Pheasant *(Lophophorus Impeyanus)* of the Himalayan Mountains, which it has several times been attempted to bring alive into this country, but hitherto without success. Others, as the Golden Pheasant of China *(Phasianus Pictus)*, delight us with the richness and multiplicity of their tints, which contrast admirably with each other. The Common Pheasant, now naturalized over the greater portion of Europe, is exceedingly beautiful, but it is far surpassed by many of its congeners, of which we may mention that elegant Chinese species, the *Phasianus Reevesii (P. venesatus*, Temm.), of which a fine specimen adorns the Gardens of the Zoological Society. It is to be observed, however, that this beauty of plumage is confined to the males; the females are universally attired in a sober dress of brown—often, indeed, exquisitely penciled with spots and zigzag lines, but totally destitute of the brilliant hues which glisten in their mates. Independently, however, of the beauty of the

Pheasant tribe, there is another point of interest which cannot be overlooked—we allude to their value as it respects the table. The flesh of all the gallinaceous birds affords to man a wholesome and nutritious food, and that of the Pheasants is, deservedly, in high estimation. Hence the introduction and naturalization of the Common Pheasant in Western Europe is a positive good; and it is desirable, therefore, to add other species to the list of those which are acclimated with us.

The Pheasants (family *Phasianidæ*) are all natives of Asia. The Common Pheasant was originally brought from the river Phasis, by the Greeks, in some of their earlier expeditions; that of the Argonauts, under Jason, has the popular credit of having introduced it. However this may be, the name given to the bird by the Greeks, (φασιανος,—in Latin, *Phasianus*)—of which all our modern European names for it are merely corruptions, points to the banks of the Phasis as the place from which it was derived; and, to the present day, the Pheasants of Mingrelia (the Colchis of the ancients) are celebrated for their beauty and size. Extreme brilliancy of plumage is, in general, the characteristic of birds dwelling in torrid regions beneath a glowing sky; such is not the case as it regards the most gorgeous and beautiful of the Pheasant tribe. On the contrary, the high mountains of the Himalaya, bordering upon the limits of perpetual snow, are tenanted by the most splendid of this family. The Impeyan Pheasant is an example in point: adapted for regions where the temperature is, at the most, only moderate, and often at a low degree, this noble bird soon dies when taken from its Alpine home into the burning lowlands of India; and hence arises one of the difficulties in the way of our obtaining living specimens in Europe. But, besides the Impeyan Pheasant, the Himalaya chain of mountains presents us with a group or genus of this family, containing a very limited number of species remarkable both for their great beauty and their characters, which indicate an affinity to the turkeys—between which group and that of the genuine Pheasants they constitute an intermediate link. The genus to which we allude is that termed *Tragopan* (Cuvier), of which three species only are known. They are easily distinguishable from all the rest of the *Phasianidæ* (at least as far as regards the male birds), by the presence of large throat-wattles, or naked carunculated flaps of skin (resembling those of the turkey), which extend from the naked cheeks, spread over the throat, and proceed down each side of the neck; while from behind each eye rises a soft fleshy horn. The whole of these appendages are capable of being contracted and dilated at pleasure, or at least in accordance with the emotions of anger, fear, &c., as we see in the male turkey: the tints of the horns and wattles are rich purple, mingled with scarlet, and are most probably changeable from one hue to another. The tail is broad and rounded, and the plumage is dotted with round spots of white on a brown or red ground, the effect of which is very pleasing.

Of the three species that are known at present, two have been but recently introduced to Science—nor, indeed, is our acquaintance with the one first described of distant date. The first species is the Horned Pheasant of Nepâl (*Tragopan satyrus*). It was first described and figured by Edwards, in the third volume of his "Natural History of Birds," p. 116—partly from a drawing sent from India to Dr. Mead, and partly from a head of the bird preserved in spirits, which accompanied the drawing. Edwards's third volume is dated 1750, and his plate was etched in 1749, as appears by the date inscribed in the corner. The alliance of this bird to the turkey was not unobserved by this writer, who in his catalogue places it among that group, while in his account of it he observes that it is, "for shape of body and proportion of parts, pretty much like a turkey, and may be ranged with fowls of the poultry kind." Dr. Latham, in his "General History of Birds," states that these birds, though by no means common, "are not unfrequent in drawings done in India; and are particularly well figured in those of Mr. Middleton and Lady Impey." . . . "In the drawings of Sir J. Anstruther it is said to inhabit the snowy regions of Thibet." Its size is between that of a fowl and turkey. It is beautifully figured in Gould's "Century of Birds."

The second species is from Thibet and the Chinese borders, and was first described and figured in the "Indian Zoology," by Mr. Gray, under the title of *Tragopan Temminckii*. Of this species, as rare as it is beautiful, a living specimen, presented by J. R. Reeves, Esq., is now in the Gardens of the Zoological Society, and constitutes, as far as we are aware, the first example of one of the present group having reached our shores alive and in health. It was procured in China.

The third species is from the northern range of the Himalaya, and was first illustrated in Mr. Gould's "Century," under the name of *Tragopan Hastingsii*; the figures are those of an adult and young male, and adult female. In size this species rather exceeds the *Tragopan Satyrus*—its total length being 23 inches.

Could the Horned Pheasants, or the refulgent Impeyan Pheasant, be imported in sufficient numbers into our island (and we trust this will be soon accomplished), there is little doubt but that they might, with proper management, become naturalized. There is nothing to fear with regard to cold. They are the natives of a cold or temperate region—they verge upon the line of perpetual snow—so that the wooded hills of our portion of the globe would not be very uncongenial to their constitution. Nor would there be much difficulty in providing them with suitable food. Grain forms the staple diet of all the gallinaceous tribe; hence the Peacock of India, the Guinea-Fowl of Africa, the Common Pheasant of Asia, the Turkey of America, have equally become naturalized and have multiplied in our western regions; to say nothing of the Common Fowl, the origin of which (the Jungle Fowl) is from India, but which, from time immemorial, has been reclaimed or domesticated, and has long since spread in this condition over the greatest portion of the globe. Thus the food of the gallinaceous tribe, and the hardiness of their constitution, fit most of them, at least, for a very extensive diffusion throughout the globe; and in this we may discern a wise arrangement of Nature, inasmuch as, of all the feathered race, they are the most valuable to man, and are at once ornaments around his dwelling and wholesome delicacies on his table. If to our poultry-yard could be added the Horned Pheasants, so closely allied to them in form, habits, and general manners, they would constitute a most important acquisition, and produce a full reward for the trouble bestowed in their naturalization.

[London Penny Magazine.

MARL.

A LETTER ADDRESSED TO THE AGRICULTURAL SOCIETY OF JEFFERSON COUNTY, GA.

BY J. H. HAMMOND. [*Concluded from May No.*

THE presence of lime is also known to influence the decomposition of the silicates of potash and soda, and at the moment of decomposition, both the silica and alkali are soluble. Thus, lime aids materially in supplying these essential elements to plants. Whether it does so by its alkaline properties, or by concentrating carbonic acid, or merely by its catalytic power, has not been settled. The silicate of lime itself, when rendered soluble by the decomposing influence of carbonic acid, sometimes, as I have stated, becomes, in their absence, a substitute for the silicates of potash and soda. It is this combination also, that renders light, sandy lands more consistent, which is one of the most important effects of lime on such lands—particularly on the light uplands so extensively planted on this side of the Savannah, and in your County. The fact is unquestionable. It is usually referred, as is the opening of stiff lands, to the mechanical influence of the lime, but the cause assigned here, as in that case, is not adequate to the effect.

The red and brown lands in your County are colored, as they are everywhere else, by iron.—You have no doubt observed, that after continued cultivation, some of the best of them cease to become productive without much apparent loss of vegetable mould, and are not rapidly restored either by rest or manure. Among other causes, this is owing to a considerable extent, to the excessive oxidation of the iron in consequence of its exposure from plowing, to the atmosphere, whence it extracts oxygen, a process you see constantly exemplified by the rusting of old iron. It becomes what is called a peroxide of iron, which is very injurious to vegetation.—Lime neutralizes all acids, and if put upon these lands in proper quantities, it will neutralize a portion of the acid in the iron, and convert the peroxide into a protoxide of iron, which, if not actually beneficial, is at least harmless to plants. You have too, in some of your soils, the sulphuret of iron, so often taken for gold ore. This, on exposure to air, absorbs oxygen, which produces sulphuric acid, and then forms the sulphate of iron or copperas, which is poisonous to plants. If lime is put on the land it will arrest the accession of the sulphuric acid thus formed to the iron, and prevent the formation of copperas. But what is more, combining with the sulphuric acid itself, it forms sulphate of lime, commonly called plaster of Paris, one of the most highly prized of all mineral manures, and an element in all, or nearly all plants. Lime has also the power of forming plaster in the same way when it comes in contact with the sulphate of silicon, which is supposed to exist in all soils. It combines also with sulphuric acid, arising from vegetable decomposition or any other source, and produces this valuable salt.

The sulphate of lime, called also gypsum, as well as plaster of Paris, must exist to some extent in all soils, as it is found in almost all plants. But, like the carbonate of lime, it is seldom to be detected by chemical tests. It may also be eliminated from unknown combinations by the vital action of the growing plant. But in the way I have mentioned, it will undoubtedly be formed in greater abundance in all soils, by the application of lime. Sulphuric acid itself is often used as a manure, but experience has fully established the fact, that it is of little value except on calcareous soils; and what is more remarkable, that sulphate of lime will also act with far greater effect on limed lands. I tried some of it myself the past year on marled land. I rolled the cotton-seed in it, previously to planting them, and thus applied it at the rate of only one peck of the plaster per acre. I am satisfied that the product, on the few acres to which it was applied, was one-third greater than on similar adjoining land, marled also, but not plastered. I anticipate, therefore, the greatest benefit from the use of plaster after marl. I should remark, however, that it has not been found invariably beneficial even on limed lands. In England, and on our coast south of Long Island, little advantage has been derived from it. Two probable causes have been assigned for this: the influence of sea air, which has not been satisfactorily explained, and the probability that the lands in the region mentioned have derived a sufficiency of gypsum already from the sulphuret of iron, or other sources. Very little is required for plants: one peck per acre applied to the moistened seed will probably have as much effect, for one year at least, as any other quantity. In the last dry season, it had on my land double the effect of a bushel sown broadcast. Five to ten bushels are sometimes applied.

Phosphate of lime is even more esteemed for a manure than the sulphate. It is sometimes called the "Earth of Bones," as bones contain over 50 per cent. of this salt. Being less abundant than sulphate of lime, it is much more costly. Bones are transported across the Atlantic to England, to be used as manure. Several hundred vessels are now engaged solely in transporting bones from various parts of the world to England. This phosphate is also an essential constituent of plants, though rarely to be detected in soils. But phosphoric acid, like sulphuric, arises from vegetable decomposition, from phosphuret of silicon, and perhaps other sources. If lime be present in the soil to fix it, not only is the vital action of the plant relieved from producing it, but much is probably saved that would otherwise be lost. The ash of cotton-seed contains considerably more of this acid than bones do, and hence the immense value of this seed as a manure. But its effects are proverbially transient. With lime in the soil sufficiently abundant to fix the phosphoric acid, cotton-seed would be a manure almost as permanent as bones. But to detail all the operations of lime in the soil, in assisting to prepare food for plants

out of the vegetable and mineral substances which compose it, would require me to write a much longer letter than you would read with patience. I have touched on the most prominent only. The general consequences, however, which follow, and which are regarded as arising peculiarly from its applications to land, require to be glanced at.

By opening stiff land, it renders it more permeable to the air, and more subject to atmospheric influence, while its surplus water more readily escapes. Quick-lime, when saturated, holds more water than common clay, such as yours, but yields it more readily to heat, and is therefore of great use in drying damp lands and rendering them warmer. But it does not give up its water so promptly as sand, and therefore renders that more retentive of moisture. In fact, marl containing 50 per cent. of carbonate of lime, and the residue chiefly fine sand, will absorb more water than the common clay of your lands, and retain it as long. During the extreme drouth last year, at one time, the plow turned up dry dirt in a field of mine marled that year at 100 bushels per acre, and not yet sufficiently mixed in the soil, while several days later, without intervening rain, in a soil equally sandy and having less vegetable matter, but marled four years ago with 200 bushels per acre, earth quite moist was turned up at the same depth. You will readily perceive and appreciate the value of marl in this respect.

By rapidly neutralizing the noxious, and vivifying the good properties of the subsoil brought up in breaking land, lime enables the farmer to deepen his soil more speedily and without risk. Mr. Ruffin's experience confirming the theory, is decisive on this point; mine, so far as it goes, is to the same effect. Lime undoubtedly hastens the maturity of crops. Writers abroad state that it advances them a fortnight. Before seeing these statements, my observation of my own crops had led me to the same conclusion. Two weeks gained to the cotton-plant is equivalent to a degree of latitude—a very material gain to us.

It is also stated on good authority, that lime in land improves the *quality* of every cultivated crop—and that it has the effect of increasing the fruit in proportion to the weed. It is well known, that while the straw, stalks, &c. of plants contain more of the carbonates, the seeds contain more of the phosphates. If the application of carbonate of lime increases the fruit more than it does the stalk, its indirect influence in producing phosphates is greater and more important than has been generally supposed, and its value is enhanced in a corresponding degree. It is said also to extirpate many noxious weeds. However this may be, I can testify that it gives great luxuriance to the growth of all the grasses with which our crops are infested. This, to the mere corn and cotton planter, may be no recommendation of it. I will state, however, that in a field planted in cotton in 1844, and rested last year, which usually produces a heavy crop of hog-weed, when turned out, there came up, although it had not been plowed at all, an uncommonly fine growth of crow-foot; which I can only account for from its having been marled. The part longest marled had the best crow-foot.

Lime is thought in England to prevent smut in wheat—to destroy many injurious insects—to preserve sheep pastured on land after its use from rot and foot-rot—and it is everywhere regarded as improving the healthfulness of drained lands. In short, it is now generally agreed, not only by scientific men, but by the best and most experienced farmers in every part of the world where it has been properly tested, that "Lime is the basis of all good husbandry,"—in which opinion I fully and cordially concur.

In endeavoring to furnish you with something like a theory of the action of lime, I have stated some—perhaps many things—which are questioned by men of great scientific attainment.—Agricultural Chemistry—indeed the whole science of chemistry—may be said to be yet in infancy. If it is difficult to penetrate the arcana of passive nature, it is far more so to investigate those active operations which are conducted in the air and under the ground, in the formation of plants, complicated as they are in addition by the yet unknown vital agency of the plant itself. Although, on the whole, the art of Agriculture has been vastly advanced by the discoveries and experiments of chemists, and he who shuts his eyes to the light they are constantly shedding for the benefit of farmers, is now, and will soon be much farther behind his age; still it is well known that great absurdities have been put forward, and with the utmost confidence, by the most eminent characters in modern science. In speaking, then, of the peculiar action of any of the elements out of which plants are formed, and its agency in the mysterious operations consummated in the production of a full-grown, matured and fruit-bearing plant, it is not only becoming, but necessary that every one, most especially a mere farmer like myself, should express opinions with great diffidence and caution, and hesitate before drawing, even from established facts, inferences of important and extensive bearing. In view of this, I ought not to omit to state to you, that within a few years past, a sweeping theory has been suggested by one of the first chemists and most popular writers of the age, that has found some able supporters, and which if true, apparently upsets everything that has been said of the effect of lime in furnishing food to growing plants out of decayed vegetable matter. Dr. Liebig asserts that that the decayed vegetable matter of the soil called humus, or mould, affords no direct nourishment whatever to plants. That they derive all their organic constituents from the atmosphere, and only their inorganic from the earth. The organic constituents of plants are those which are dissipated when they are burnt and in most vegetables amount to from 97 to 99 parts in 100. The organic constituents compose the ashes which are left by fire, amounting usually from 1 to 3 parts in 100, in some rare cases to as much as 12 per cent. The only nourishment which, according to this theory, the soil affords to plants, being thus limited to from 1 to 3 parts in 100, the utmost direct influence of good or bad soils, of manure of all kinds—of lime, alumina, silica, and all mineral elements, can reach no farther than to the modification of an hundredth or at most a thirty-third part of the crops we cultivate. It follows that the world has all this time labored under a most important error in estimating at such vastly different values what we call rich and poor lands. That the effects of manure are in a great measure fanciful, or at least that from 1 to 3 lbs. of ashes are equivalent to 100 lbs. of vegetable matter, as an application to the soil, and that it is useless labor to put on manure in any other form. Knowing as we do that a single drop of prussic acid will almost instantly extinguish life, it would not be fair to deny very great influence to even the

smallest proportion of inorganic matter in the production of plants. And since Liebig concedes that until the leaves are formed, the plant derives its carbonic acid from an artificial atmosphere generated by the contact of humus in the soil with the air, it would not be safe to denounce this theory in the present state of science, as absurd. It is admitted too on all sides that plants do assimilate carbon from the atmosphere, and it seems established that ammonia descends in rain water. However true this may be, and though Liebig's theory was established as perfectly so in all its parts, I should think it most prudent to hold on still to what experience and rational deduction have taught us of the influence of vegetable mould on crops, in the hope that farther discoveries might harmonize old facts and new truths, especially as none of us would set about improving the atmosphere, or desire to add more carbonic acid or nitrogen to it, since any material increase of these elements would render it fatal to animal life. Indeed, no scientific discoveries or force of logic can ever, I am convinced, for an instant shake your confidence or that of any practical farmer, in vegetable mould and compost manure; or lead you to doubt that the amount of your crop, if properly tilled under fair seasons, depended in all other respects wholly and solely on the quality of your land. Whether the soil furnishes 1 part or 99 parts in a hundred —you have too often seen plants on the same acre subject to the same identical atmospheric influences throughout, varying from good to worthless, according to the soil, to question the important fact that by improving your land you improve your crop in the same ratio precisely, and that by exhausting it you equally deteriorate the crop.

In fact, depth of soil, by which we mean depth of decayed vegetable mould mixed with sand, clay, &c., has been with you, as with all the world heretofore, a criterion, and a never failing one, of the value of land, and so it will forever continue to be, I venture to assert. If then, as I believe, and you will probably agree, plants derive their most important constituents of all kinds from the soil and from vegetable mould, the value of lime in the soil is by no means limited to its action on the mineral or inorganic constituents of it, but extends to the production also of those organic elements which preponderate so immensely in all vegetation.

But your inquiry of me was in reference to marl. I must, therefore, remind you again that all which has been said of lime is true of marl. If it is slower than lime in its early operations, that is more than compensated by many advantages which it possesses. This is becoming so well understood that, wherever the same quantity of lime can be placed on land as cheaply in the form of marl, it is rapidly superseding the use of it in all other forms. Marl contains, besides carbonate of lime, other valuable constituents. Its silex and alumina, though fine in quality, are not of much consequence, since they are never thus applied in sufficient quantities to affect the soil materially. But some marls—those in Virginia, for instance—contain sometimes sulphate of lime and the valuable green sand of which I have spoken. As the sulphate of lime exists there in Eocene marl, it may be discovered in our formation. I have seen green sand in specimens from several localities in this State. A deposit of green sand, such as is found and used to an immense extent in New-Jersey, would be more valuable in your County than the richest gold mine in the world. There is none of it at Shell Bluff. I have already spoken of phosphate of lime. In marl from Ashley River, in this State, which belongs to the same formation as our marls, 5 per cent. of this phosphate has been discovered. From some crude experiments of my own, I am inclined to believe it exists in some of the marls at Shell Bluff, and probably in yours—to what extent I would not undertake to say. But 5 per cent. of it would give you the equivalent of 9 bushels of ground bones in every hundred bushels of marl, which alone would be worth more than the whole cost of applying that quantity of marl, though the expense of it might be five dollars. We cannot, however, expect to find it in such quantity in all the marls we use. Those will probably be richest in it in which are found remains of bones and teeth. In the shell marls on the Rhine, recent analysis has detected an important proportion of azote, derived, it is supposed, from animal matter. This is the most powerful, as you know, of all manures. There is every reason to believe that a scrutiny equally rigid would disclose a valuable proportion of it in our shell marls here.

The duration of marl in the soil is undoubtedly greater than that of lime. The question of the duration of calcareous earth applied to lands is one of great importance itself, and about which you will, no doubt, desire to be satisfied before attempting to use it. I have mentioned already that the ancients regarded marl as producing its effects from 10 to 80 years. Lord Kames states an instance of their being observable for 120 years, and Mr. Ruffin another of 60 years. Few or no records of such experiments have been handed down from generation to generation. In those countries where lime and marl have been used most extensively and for the longest period, it is impossible to say how long the land produced before they were applied at all, in comparison with its production now. Of late years, more accurate accounts have been kept. The peculiar effects first observed to follow the application of lime have been thought to disappear or materially diminish at various periods, reaching from 4 to 40 years, according to the amount applied and other circumstances. It is supposed by writers and farmers abroad that about 3½ bushels of it are consumed per annum by the crop, and that in general the influence of any quantity will cease in from 12 to 20 years. But these conclusions are not to be relied on. It is certain that no crop will take off so large an amount as 3½ bushels, and the loss from other causes is altogether indefinite.—While though, at the end of 20 years, the same precise effects as at first may no longer be observable, it by no means follows that this may not be owing to the want of proper applications of other manures that would excite the lime again to its original action. Mr. Ruffin thinks that marl, once placed on land, will endure as long as the clay and sand in it. Though we might not indulge fully in this belief, I am of opinion that it will last for a period which may be called indefinite, from its remoteness—particularly when crops are grown such as we cultivate. Irish potatoes consume more lime than any other crop, perhaps; nine tons, which are sometimes grown upon an acre, though not with us, abstract about 266 lbs, or say 3½ bushels—but 260 lbs. are contained in the tops, which we never take from the land. A thousand bushels of turnips, tops and all, consume about 2 bushels

of lime. Wheat, the cultivation of which is extending among us, requires for a crop of 25 bushels, straw and all, about 9 lbs. or a half peck.—Cotton and corn do not require more. Seed cotton sufficient to make a bale of 400 lbs.—that is, 1400 lbs. in the seed—will consume about 3 lbs.; and most of that in the seed which is invariably restored to the land. If we treble this amount for the stalks and leaves—which, however, usually rot on the ground—the exhaustion of lime by our heaviest cotton crops will not exceed half a peck when every thing is taken off. Thirty-five bushels of corn will consume only about 1¾ lbs. of lime; if we add six times this amount for the cob, shuck, blades and stalk, it will not require more than cotton or wheat. I am not aware that our cotton-stalks, or our corn-cobs, shucks, stalks or blades, have ever been analyzed; but I have, I think, fully allowed for the lime they may contain. And, at these rates of exhaustion, 30 bushels of lime, which is about the quantity contained in 100 bushels of marl that has 60 per cent. of the carbonate, will supply the wants of our usual crops, when much larger than we now average, for 240 years, if the land was cultivated so long without rest or restoring anything to it. The consumption of the crop, then, is next to nothing. The loss arising from other causes is undoubtedly greater.—Quick-lime dissolves in 750 parts of water. A fall of 44 inches of rain, which is less than the annual average quantity that falls here, would afford water sufficient to dissolve 170 bushels per acre. Quick-lime, when spread on land, however, becomes a carbonate, and nearly insoluble, too soon to lose to this extent. Still, a considerable amount might be lost in this way, by a heavy rain immediately after liming.—Lime, after being burnt, falls into a powder.—Its minute particles are forced by showers, aided by deep plowing, into the subsoil; and much may be thus carried off. When these things are considered, it is obvious that all the lime in land may in time be exhausted, as it has been from our "drifted" soils. But the chances of its duration are greatly increased by being applied in the form of marl. Being a carbonate, it is soluble by the carbonic acid in rain-water only in small quantities, and ages must elapse before it could dissolve and carry off any great amount; and not having been reduced to a fine powder, its particles are too large to be readily driven down into the subsoil, below the reach of the plow. Without, then, assigning any precise limit for the duration of marl, I think it may be safely concluded that the effects of a sufficient application, under proper culture, will last for a longer period than we can conceive ourselves to have any direct interest in the land to which we may apply it.

With regard to what is a sufficient application, there is a great diversity of opinion, and consequently of practice. Viewing it chiefly as a direct manure, in many parts of Europe, lime is applied at the rate of 8 to 10 bushels per acre annually—in others, at 10 to 12 bushels every third year; and again, in other parts, at 40 to 50 bushels every twelve years. But as its indirect effects are as important, and far more numerous than its direct, and it is therefore an invaluable elementary constituent of soils, the true rule for its application undoubtedly is to furnish the soil at once, if possible, with as much as its constitution will bear, and to repeat the dose as frequently as the improvement of that constitution will permit, since the more lime, everything else being in due proportion, the larger the crops. Acting on this principle, many farmers in Europe put on 3 to 400 bushels of lime at once, and sometimes 1,000. Such liming is probably excessive there, and in our climate would be utterly destructive. Marl, however, containing from 50 to 70 per cent. of carbonate of lime, may be safely used in four times the quantity we can use quick-lime. The usual dose of marl of that quality in Virginia varies from 2 to 300 bushels. But more can be applied even in Virginia than here. The hotter the climate, the more caution is necessary, in the first dose at least; though this is greatly dependent on the condition of the land to be marled. In the hot and dry climate of Egypt, the fruitful Delta of the Nile contains 25 per cent. of carbonate of lime, which is equivalent, in one foot depth of soil, to some 20,000 bushels per acre of marl containing 50 per cent.; but that soil is much deeper, and its vegetable mould inexhaustible. Depth of soil, and the amount of vegetable matter in it, must chiefly regulate the quantity of marl. M. Puvis has given an interesting table in reference to this. He thinks that we may give to a soil three inches deep, 40 bushels of marl, containing 60 per cent. of carbonate of lime, or 50 bushels containing 50 per cent.; and to a soil six inches deep, 80 bushels at 60 per cent. or 100 at 50 per cent. He does not refer to the vegetable matter, or other circumstances of the soil. I presume that the depths of the soils you cultivate range between the extremes stated, or at least that you seldom plow, and would not, therefore, mix the marl deeper than six inches. I think the amounts he specifies are very safe. As some of my lands are similar to yours, and our climates the same, I will give you my experience on this point. I began to marl by putting 200 bushels per acre, that averaged about 60 per cent. carb. of lime On old mulatto land, with a soil about six inches deep, and containing about 4 per cent. of vegetable matter, I have not yet, after four years, perceived any injury from it. On lighter land, containing less vegetable matter, and a soil four to five inches deep, I discovered marl burns the second year. Previously to this discovery, however, I had taken the alarm, and reduced the quantity to 150 bushels, on land similar to the last mentioned. On all the thin spots I perceived the "marl burn" from this amount. I then farther reduced the marl to 100 bushels per acre, from which I have as yet perceived no injury. Being now about to finish the marling of all my open land, it is my intention to go over it again, and to add 50 bushels per acre at a time, until I have given to all 200 bushels. I shall by no means, however, venture to do this until, by resting and manuring, I have also furnished to it additional vegetable matter.

I think I may safely recommend you to apply 100 bushels per acre, of the richest marl you have, to any land that now gives you remunerating crops, and 200 bushels or more to your best lands. If they are low and sour they will bear still more. I am now putting 250 to 300 bushels on some swamps I have drained, which have several feet of vegetable mould. I should not be afraid to put 1000 bushels per acre on such land—though here I think quick-lime would be the best application, as it would hasten decomposition.

It is always most convenient to apply marl to resting lands, and it is also a great advantage to

secure, by this means, a new coat of decaying vegetation to start with. So new grounds should be marled the first year; if marled before clearing it would be better still. Very old and exhausted land should be rested two years previously to marling; and, in all cases, thin knolls should, if possible, be manured when marled. But a little experience will furnish you the best guides in this regard: you will soon discover all the dangers, and learn to apply all the remedies.

Experience will also teach you, in a very short time, the best and most convenient methods of digging, carting and spreading marl. There are some difficulties connected with digging from marl pits, which, with the means of overcoming them, are stated in Mr. Ruffin's work. They arise chiefly from water, which must be drained off, or pumped out, according to circumstances. I have no experience on this point. My marl is cut from the face of the cliff at Shell Bluff. It is estimated that if a stratum of marl is 12 feet thick, 12 feet of covering may be removed to procure it, without hazarding too much. But should you find marl, you need not apprehend much danger of working through it. The great formation, of which it is a part, is of unknown depth. Over 100 feet of it is exposed at Shell Bluff; it has been penetrated more than 300 feet in Charleston.

In hauling out marl, the most economical method is to use carts with two mules or horses. In a cart properly made, they will haul 18 bushels at a load as easily as one mule will haul 6. The carts should be made with three shafts, so as to divide the weight of the load equally between the mules, and the tread of the wheels should be 4 inches—axle-trees of iron. In putting on 100 bushels to the acre, the land should be divided by furrows into squares 28 yards each way. This will give 6 to the acre. A load of 18 bushels to each square will rather exceed 100 bushels per acre, but some will always be lost. The full effect of marl cannot be felt until it is thoroughly mixed with the soil. Hence, the first year, little is to be expected from it, and it seldom reaches its maximum until the fourth crop—not always then. Its effects may be hastened, and, what is also important, rendered equal, by spreading it with regularity over the land. It is best, therefore, to sow it broadcast with the hand. Each laborer should take his square and spread the pile, using a tray or board to assist him. A hand will spread 9 piles of 18 bushels each in a day.

The distance to which marl may be carted depends altogether upon circumstances—one of which is the quality of the marl; another, that of the land; others, the facilities for digging, state of the roads, &c. Along the coast of Scotland, it is transported by sea from 80 to 100 miles. I have been very recently informed that at a single marl bank on James River in Virginia, 10 rigged lighters are now engaged in delivering marl to a distance of from 8 to 20 miles up and down the river, receiving 3 cents per bushel for it, though it is much inferior to ours in quality. The marl I use averages about 60 per cent. of carbonate of lime. I cut the whole of it down at Shell Bluff, and boat it 12 miles up the Savannah River, re-land and cart it. I have marled about 700 acres within a mile of my landing here; but I have hauled some marl 4 miles, and have spread it on about 500 acres, the nearest part of which is over three miles from the river. This is of course very expensive; but I think it profitable, notwithstanding. If I could lay down any rule to regulate the cost of marling, it would be this: That where land is deficient in lime, it would be a safe operation to expend an amount equal to the present value of it, if so much should be necessary to marl it sufficiently. This rule I suggest upon the principle that it would be profitable to pay twice for land, if you could thereby double its production without materially increasing the cost of cultivation.

You will naturally inquire whether any one might reasonably calculate on doubling the production of his land by marling. I believe he may, if the marl is judiciously applied and the proper system of after-cultivation adopted. I have seen but few statements of the actual results of marling in Europe. It is said in general terms to produce a great increase, though occasionally it is mentioned that the crops were doubled. So perfectly established is the use of lime and marl there, that every one who can procure them uses them as a matter of course. It is not considered an experiment, and tables of results are not therefore given—at least I have seen none. A few years ago, Mr. Ruffin addressed interrogatories touching the effect of marl as exhibited in the crops to a number of the most respectable farmers of Virginia, who had used it, and received answers from twenty-two, many of whom had marled extensively and for a number of years past. These answers were published in the Farmer's Register and in Mr. Ruffin's Report of his Agricultural Survey of South Carolina. Their marl was of various qualities, applied in various amounts per acre, and on different kinds of land, which had been subjected generally to very severe cropping before. No one of these estimated the increase of his crops from marling at less than double, and some of them rated it as high as 400 per cent. I have no doubt that, under favorable circumstances and good management, the last-mentioned increase, enormous as it is, may be often realized. The prospect, however, of doubling the crop with reasonable certainty, is promise enough, one would think, to set every one to marling who can do it within the cost I have mentioned. I have not myself yet doubled my own crop with the use of marl, nor might the practical results of it, which I ought to state, be so striking to a careless observer as he might expect, after all I have said on the subject. They satisfy me, however; and I feel perfectly certain that in a short time the crops on all the land I plant will be at least doubled, from the effects of marl alone, and much more than doubled in consequence of other additional applications I am making. I commenced marling in November, 1841. I marled only 175 acres for the crop of 1842, the results of which I reported to our State Agricultural Society, as I did those of 1843, on the same land. They were published, and some of you may have seen them; I will, therefore, only repeat the tabular statement of those years, and add to it that of the past year. In 1844, these lands rested. The experiment marked No. 1 was made on mulatto land lying on the river bluff, which in appearance, and perhaps in most other respects, is much the same as the best upland cotton soils in your County which have been as long in cultivation. Experiment No. 2 was on light, sandy soil; the sand is very fine, but, altogether, the soil is inferior as any, probably, that you plant in cotton. I could scarcely have selected lands less calcu-

lated to give the marl a fair chance, both having been cleared more than a century ago, badly scourged, and of course greatly exhausted of vegetable matter.

EXPERIMENT NO. 1. MULATTO LAND.

1842.	Seed Cotton.	Less than unmarled acre.	More than unmarled acre.	Per ct.
Acre not marled	1111 lbs.			
Do. marled 100 bushels	846 "	265 lbs.		.....30·
Do. do. 200 "	1003 "	108 "		.....10·7
Do. do. 300 "	1318 "		207 lbs.	.....17·7
1843.				
Acre not marled	493 lbs.			
Do. marled 100 bushels	654 "		161 lbs.	.....32·6
Do. do. 200 "	759 "		266 "	.....53·9
Do. do. 300 "	841 "		348 "	.....70·
1844—Rested.				
1845.				
Acre not marled	324 lbs.			
Do. marled 100 bushels	481 "		157 lbs.	.....48·4
Do. do. 200 "	584 "		260 "	.....80·2
Do. do. 300 "	642 "		318 "	.....98·

EXPERIMENT NO. 2. SANDY LAND.

1842.	Corn.	Less than unmarled acre.	More than unmarled acre.	Per ct.
Acre not marled	17 bushels.			
Do. marled 100 bushels	21 "		4 bush.	..... 23·5
Do. do. 200 "	21 "		4 "	..... 23·5
Do. do. 300 "	18½ "		1½ "	..... 8·8
1843.	*Seed Cotton.*			
Acre not marled	361 lbs.			
Do. marled 100 bushels	451 "		90 lbs.	..... 24·9
Do. do. 200 "	384 "		23 "	..... 6·3
Do. do. 300 "	173 "	188		.....108·6
1844—Rested.				
1845.				
Acre not marled	230 lbs.			
Do. marled 100 bushels	317 "		88 lbs.	..... 37·7
Do. do. 200 "	301 "		71 "	..... 30·8
Do. do. 300 "	159 "	71		..... 44·6

The first thing that will strike you on looking at this table will be, that the crops have regularly and excessively diminished, from the time the land was marled. It might be concluded that I had ruined my land by marling. Such I would candidly own would have been my own conclusion, if fortunately I had not kept these unmarled acres to test the success of my operations. Disastrous as have been the three last crop seasons in this section of country, I would not have believed it possible that there could have been such a falling off from seasons alone, and I should have abandoned marl, in spite of the experience of the rest of the world, as injurious, at least to my soil. But great as has been the decrease of production on all the acres, it has been far greatest on the unmarled ones. That of the others has comparatively steadily increased, except the 200 and 300 bushel acres in No. 2, both too heavily marled, but both recovering again under the rest of 1844. In No. 1 the acre with 100 bushels has increased from 30 per cent. below to 48·4 per cent. above the unmarled one, making an actual comparative increase of 78·4 per cent. The acre with 200 bushels has in the same way increased 90·9 per cent. Both these acres are decidedly inferior to the other two in No. 1, and have, I do not doubt, produced this year double what they would have done without marl. The other two acres in No. 1 are a pretty fair test of the influence of marl, being as nearly equal in quality as could have been selected. The sandy land, in time and with proper management, will, I am certain, exhibit results fully as favorable as the mulatto land. It was too far exhausted when marled. I did not reserve test acres on any other fields, but I feel sure that they have derived equal advantage from the marl, in proof of which I could state many facts to one present on the spot, which it would be tedious to mention and explain fully in this letter. I will only state one: The unmarled acre in No. 1 is one of the best acres I plant. In 1842, it yielded 1,111 lbs. The average of my whole crop that year was 666 lbs. per acre. The last year, the same acre, *after a rest*, produced 324 lbs. The average of my crop was 391 lbs. per acre. Thus, the yield of the unmarled acre was in one instance 66·8 per cent. above, and in the other, 20·6 per cent. below the general average—making a difference of 87·4 per cent. in favor of the marled lands. Let me add, that in 1842 the unmarled acre in No. 2 produced 8·8 per cent. less than the average of the crop. In 1843 it fell to 37·6 per cent. and in 1845 to 70 per cent. below the general average. If these facts may be assumed as data on which to base a calculation, had the last year been as favorable in all respects as 1842, the average of my cotton crop must have been over 1200 lbs. of seed cotton per acre, and of my corn crop over 28 bushels per acre. This, however, is only a *paper* calculation, and 1842 was a fine crop year. Time will reveal the truth.

I cannot give you a better evidence of the firmness of my faith in the virtue of marl, than to state that, notwithstanding the discouragements of the last three extraordinary seasons, I have, at great expense, brought up from Shell Bluff, within four years, over 300,000 bushels, carted it out, and spread it over about 2,300 acres of land; and am at this moment as actively engaged at it as ever. Nor do I look forward to

a period when I expect to cease using it to a considerable extent every year, either on fresh lands, or in increasing the dose on those already marled. It would be leading you into error, however, to leave you to suppose that I rely solely on the marl to improve my lands. Rest, in connection with it, is indispensable, and manure becomes far more beneficial. I have, accordingly, by opening more land, and reducing my planting, enabled myself to rest annually one-third of my fields. And I have already hauled out and mixed together, for the coming crop, 96,000 bushels of muck, and 48,000 bushels of manure from stables and stable-yards, hog and ox-pens, &c., having yet about 20,000 bushels more to carry out before planting. I shall not only endeavor to increase this amount of manure every year hereafter, but also, by clearing and reducing the land in cultivation, to rest, as nearly as may be requisite, each field every other year. Indeed, the management of land after it is marled is of the utmost consequence to the efficiency and profit of marl. Though lime is itself a portion of the food of plants, and therefore a manure, this is perhaps the very least of its virtues. Its indirect operations are far more important. It is the grand agent that prepares for the crop nearly all the food which the earth furnishes. It is the purveyor-general—no, the farmer must fill that office: it is the "*chef de cuisine*" that selects the ingredients, mixes and seasons almost every dish to suit the delicate appetite of the growing plant. It is from the materials placed in the soil by Nature, or the industrious husbandman, that this skillful artist draws the rich repasts it furnishes; and it could no more furnish them without these materials, than your cook could make your soup without joints and spices. The larder of the marl must, then, be amply supplied. The means of doing it are rest and manure. The great gain to the farmer is, that having once engaged in his service this powerful, untiring, and almost universal agent, he may safely exert himself to the utmost of his ability to supply it with everything necessary to carry on its important operations. Seizing on whatever is valuable, it preserves it from waste—combining with the utmost generosity the wisest economy, it not only yields to the plant all it requires, but stimulates it to ask more, while it is inaccessible to demands from all other quarters.

There is no fancy in this—Theory and Experiment unite to prove it true. And I trust that no great length of time will elapse before marl shall have written its own eulogy in indelible characters over all the broad fields of your County.

Permit me to conclude this letter, for the great length of which I owe you an apology, by returning my acknowledgments for the honor you have done me in electing me an honorary member of your Society, and by wishing each member of it the utmost success in his Agricultural pursuits.

I am, very respectfully,
Your ob't serv't.
J. H. HAMMOND.

HAMILTON RAIFORD, Esq.
Corresponding Secretary of the Agricultural Society of Jefferson Co., Georgia.

NOTES ON THE MANAGEMENT OF SHEEP:

FOUNDED UPON REPORTS OF COMPETITORS WHO GAINED PREMIUMS AT THE WOOL COMPETITION HELD AT EDINBURGH IN 1845.

CHEVIOT SHEEP.—*Mr. Anderson, Sandhope, Selkirk.*—The flock consists of about 1,000 ewes of ages varying from one to six years, and it was reared exclusively on coarse hill pasture, elevated from 1,000 to 2,000 feet above the level of the sea. The stock ewes get no artificial food, except on the occasion of a severe storm, when they are supplied with a little natural hay. To afford such aid, unless urgently required, would tend to lessen the exertion of the sheep to provide for themselves. The tups are bred from selected ewes by the best rams, and put on grass and turnips during winter and spring. The washing takes place about the end of June in a pond, into which the sheep are made to leap from a platform raised about two feet above the surface of the water, and then caused to swim twice or oftener across, as may be necessary for cleansing them. The clipping is performed about eight days after. The animals are laid on a stool, the operator proceeding lengthways in parallel lines an inch in breadth, and making the cuts as low and smooth as possible. The price obtained for the clip of Cheviot wool in 1845 was 28s. 6d. per stone of 24 lbs.; and for the black-faced clip, 13s. per stone. Wethers are not kept; but barren ewes, sold from the hill pasture at the end of autumn, weigh about 13 lbs. per quarter. The average weight of a Cheviot fleece is 3 lbs. 7 oz.; and of a black-faced, 4 lbs.

The black-faced flock, containing 600 breeding ewes, is similarly managed.

Mr. Gentle, Dell, Inverness.—The flock, in which there are 500 shearing ewes, is washed about the 18th of June. The sheep are driven three times through an arm of a fresh-water lake, having to leap into the water from a breastwork four feet high, and to swim from thirty to forty yards. The clipping follows about the 22d of the same month. It is done longitudinally, with an even and rather bare cut. The clipper is seated on a smearing-stool, which is covered with a tough sod, to prevent the animals being hurt. The pasturage consists of common mountain grasses, much intermixed with heather, and its altitude varies from 1,000 to 2,000 feet above the sea. In winter and spring, however, the sheep, when the inclemency of the weather makes it necessary, are brought to lower ground, at an elevation not exceeding 100 feet. The clips of 1844 and 1845 were sold at 18s. per stone of 24 lbs. Three-year-old ewes have been sold for £25 10s. per score—a price considered less

than their value. Such sheep, getting good turnip feeding till the end of March, would weigh, on an average, from 18 to 20 lbs. per quarter; but individual sheep have weighed 25 lbs. per quarter. The fleeces of the shearling ewes will be about 4 lbs. weight each on an average; but, taking fleeces of all classes, the average per fleece will be about 5 lbs. The fleeces are understood to consist of laid wool.

Mr. Tweedie, Deuchrie, Prestonkirk.—The flock contains from 300 to 400 shearlings. The sheep are washed in June by making them leap three or four times into a pool, and swim fifteen or twenty yards. They are generally clipped within a week after, the shears being used longitudinally. The pasturage is on the Lammermuirs, poor and mostly heath. In winter and spring, turnips and hill pasture are the means of support, each being afforded daily. The clip of hogg and ewe wool in 1845 sold at 29s. 6d. per stone of 24 lbs. For the last five years, a bath mixture, prepared by Brown of Haddington, has been used in autumn; and, while it has kept the stock quite clean, it is easily applied. Three men to dip, and a boy to drive water, can easily bathe 600 or 800 sheep in a day. The apparatus is not very expensive, and it promotes the comfort both of men and sheep. It consists of a tub for dipping, and a large trough in which the sheep, after being dipped, stand to drip—and so constructed that the drippings run back into the tub. Since the adoption of this plan, the wool has always been considered very fine, and, indeed, the best shown at a local exhibition.

Black-Faced Sheep.—*Mr. Vere Irving, Newtown House, Moffat.*—In the district of Moffat it is not customary to wash black-faced sheep. The shearling and barren ewes, and the rams, were, in 1845, clipped on the 2d July, and the rest of the flock, consisting of ewes rearing lambs, on the 19th of the same month. In 1844, the clipping of the latter class of stock took place some days earlier; but this is not considered advisable, as the wool last season was better risen than in the preceding year. In clipping black-faced sheep, the shears are run from head to tail; but, in the case of Cheviot sheep, they are directed over the shoulder and back. The latter method produces a neater clip, but the former is more expeditious. The farm rises from a base of 910 feet above the level of the sea, to an altitude of 1,550 feet above it. The lower portion, which is divided into parks, and is well sheltered, is occupied with dairy-stock, grain, green-crop and hay; and, for the greater part of the year, the sheep are entirely confined to the upper division, or steep ground. The pasture is short and of a bright color, intermixed with coarse bent, which requires to be burnt in spring. Some years ago, part of the benty ground was plowed, heavily limed, and sown with grass seed; and thus a great improvement was effected, the bent having been replaced by a bright green pasturage, which cannot be distinguished from those portions of the ground that are not naturally covered with bent. In winter and spring, the sheep, if their condition seems to demand it, are admitted into such of the lower parks as have been cut for hay, or pastured during the summer by the dairy stock, which is then fed in the house. The sheep are let down from the higher ground in the morning, but are invariably put out of the parks between one and two o'clock in the afternoon. In the event of a severe snow-storm, they are fed with meadow hay, which is carried out to them. In weaning the ewe lambs intended for stock, they are put into one of the parks for a week, and then allowed to return to their mothers, whom they recognize, but no longer attempt to suck. An advantage of this plan is that the lambs follow their dams through the winter, and, if there is snow, they are helped by them to scrape, so that they do not so often need to be fed with hay as when they are kept separate all the winter. The last clip sold fetched 12s. per stone of 24 lbs. for fleeces of all denominations.

Cross between Cheviot and Leicester Sheep.—*Mr. Brown, Halls, Dunbar.*—In the flock there are about 600 hoggs. The usual period for washing is about the end of May or beginning of June; and the plan followed is that of placing four or five men in a stream of clear water up to their middle, one above the other, and passing the sheep, one by one, from the lowest to the highest—each man, in turn, plunging the animal in the water. The shearing follows in three or four days, when the natural oiliness of the wool, extracted by the washing, is restored. The operation is performed in an open shed, laid with green sods. One or two women attend for the purpose of freeing the fleeces from particles of clotted wool, and afterward winding them. The price obtained for the clip last sold was 31s. per stone of 24 lbs.—The pasture on which the Cheviot ewes are grazed, from which the half-bred lambs are reared, is situated on the northern boundary of the Lammermuirs. The lambs are weaned about the middle of August, when they are removed to the sown pastures on the farm. In November they are bathed with a mixture of tobacco liquor and spirit of tar, in the proportion of half a Scotch pint of the former to a wineglassful of the latter for each sheep. They have then a few turnips laid on their pasture, and, when they have fully acquired a taste for them, they are folded on turnips alone during winter and spring, or until grass is ready for them—which, on the high situation to which they are transferred, is, in ordinary seasons, about the middle of April or beginning of May.

HOME AND FRIENDS.

BY CHARLES SWAIN.

Oh! there's a *power* to make each hour
As sweet as Heaven designed it;
Nor need we roam to bring it home,
Though few there be that find it!
We seek too high for things close by,
And lose what Nature found us;
For life hath here no charm so dear
As home and friends around us!

We oft destroy the present joy
For future hopes—and praise them,
While flowers as sweet bloom at our feet,
If we'd but stoop to raise them!
For things *afar* still sweetest are
When Youth's bright spell hath bound us;
But soon we're taught the earth hath naught
Like home and friends around us!

The friends that speed in time of need,
When Hope's last reed is shaken,
To show us still that, come what will,
We are not quite forsaken:
Though all were night, if but the light
From *Friendship's* altar crowned us,
'T would prove the bliss of earth was this—
Our home and friends around us!

HOUSEWIFE'S DEPARTMENT.

The more any man of any discernment sees of the world, and reflects on the relations subsisting between and the offices performed by the various members that constitute one family, (and with families make up society); the more deeply will he be impressed with the dignity and importance of the duties which social arrangements assign to the *mistress of every well regulated household;* and the high honor and esteem to which she is entitled when these duties are well executed.

Let but her part be neglected, or carelessly or ill performed, and chaos soon takes the place of order, neatness and economy take their departure, and domestic misery and ruin are too sure to enter, close on the heels of pride and indolence. There is nothing more beautiful, nothing to which a sensible man more readily pays the homage of his admiration and respect, on his entrance in the domestic circle of the old Southern States, than the cheerfulness and alacrity with which he still sees the ladies there, both mother and daughters, of the most opulent, and best bred families, play out in full measure, their appropriate parts in the management of domestic affairs, and when occasion demands, even of the outdoor concerns. To be familiar with all the duties of housewifery, seems to form, in fact, as we have lately witnessed with high gratification, a part of the education of young ladies of the amplest fortune, the most refined manners and the highest intellectual cultivation. And where, it may well be asked, can beauty and intelligence be seen to more advantage, than in the exercise of duties which do and ought to constitute a great portion of the employment, sometimes of daughters on whom the loss of a mother may devolve the care of a household, and especially of every married woman who would see her husband prosperous, respected and happy? All who are at all familiar with the history of rural life in the old "plantation States," must know of instances of remarkable women, who, with an energy of character almost beyond their sex, have grappled with adversity brought on by the indolence, extravagance, or misfortune of their husbands: and while clearing their estates of the most frightful embarrassments, have contrived to educate their families, and finally to leave them in the enjoyment of their wonted respectability and independence. Forever honored be the memories of such noble women! Too much gratified should we be to preserve in the Housewife's Department of the FARMERS' LIBRARY the fullest memorials of such as thus do honor to their sex and their country; and may we not appeal to the gallantry and justice of readers who can appreciate our views, to aid us in preserving suitable memorials of those whose lives afford to society, examples so useful?

While military heroes of all degrees, and not a few of doubtful merit, swing in their gorgeous trappings on every tavern sign; while partisans, floating for the moment on the top of the tide, emblazon the front of political reviews, and while our popular and fashionable magazines glare with costly pictures of noble dames in courtly attire, or with the meretricious representations of fashionable *artistes*, dancing half naked in "mid air;" all well calculated to beget ideas and inclinations the most vitiating and effeminate; where do we find the portrait or biographical sketch of the noble matron, in the midst of her homely avocations, laying "her hands on the spindle or the distaff," counting her poultry, inspecting her dairy, or teaching her children? and yet, to saying nothing of the present, how many illustrations might be drawn from old family annals, of women of the finest character who without seeking it, won distinction by thus looking after the "ways of their household."

Not on their own accounts should the memories of such women be honored, for they are gone beyond the reach of praise—who cannot call to mind some who have been called away in the midst of their usefulness and at the very moment when they were most dear and most necessary to those who remain to deplore their loss?

"Why is it thus that fairest things,
The soonest fleet and die?
That when most light is on their wings
They're then but spread to fly?

And, sadder still, the pain will stay
The bliss no more appears;
As rainbows take their light away,
And leave us but their tears."

No! no! It were for no such vain purpose that we would commemorate the virtues of such women! but to give assurance to our daughters, to those who are to be the future mothers of the Republic; that for them as well as for our sons, honor shall be the reward of excellence, and *their* virtues too be gratefully recorded.

That posthumous honors should be reserved for our sex alone, or living ones be lavished exclusively on women of high rank, or on those who can make the most impressive public display of courtly and fashionable costume, or mere physi-

cal powers and development, is as unjust in itself, as it is inexpedient and pernicious as regards the welfare of American society. In that Department of the FARMERS' LIBRARY then, which is set apart for Housewives and their concerns, there shall at least be one place reserved for registering the merits and virtues of such as in the performance of their housewifely duties, may have most eminently deserved to have it said of them:

"Many daughters have done virtuously, but thou excellest them all."

Who will suggest a subject and aid us in the performance of this promise? We pause for a reply.

A SUCCESSFUL METHOD OF RAISING DUCKS.

From the Southern Agriculturist.

CHARLESTON, February, 1833.

BELIEVING it to be the duty of every individual to contribute for the benefit of society, any information he may possess, however small, and on subjects ever so humble; and having for several years past been in the habit of seeking recreation during those hours which were not devoted to severer studies and labors, in a variety of experiments on subjects of Natural History, I propose giving you the result of some experiments in raising ducks, which were carried on during a number of years, and which finally eventuated in complete success.

It is sometimes beneficial to examine the causes of our failures, and it affords me pleasure at this moment in retracing the steps by which, after many disappointments, I gradually accomplished the objects to which my inquiries and experiments were directed. As an account of the process by which I arrived at these successful results may not be uninteresting to those of your readers who devote themselves to rural pursuits, and who pride themselves on having a well-stocked poultry-yard, I hope it may be no tax upon their time and patience, if I go somewhat into detail.

During many years I was struck with the general want of success which attended the raising of this species of poultry. Not one-sixth of the young were ever raised—they appeared to be subject to innumerable diseases. Those that escaped were stunted in their growth, and did not arrive at full size till they were many months old. The general complaint among farmers and planters was, that this, the most valuable of our poultry, was a puny bird, hard to raise, and subject to many diseases. They could raise fowls and even turkeys, but there was no certainty with regard to the duck.

Desirous of investigating the causes of a failure in raising a bird which in its wild state is very hardy—which, although exposed to all the vicissitudes of the weather, raises large broods of young, I procured several ducks, determined to pursue my experiments in various ways till I should either be successful or be satisfied that in a state of domestication, there existed obstacles to their successful rearing which no foresight or care could prevent.

At first I adopted the usual mode of giving them access to as great a body of water as I could provide for them in the yard. I therefore had an artificial pond made near their coops, to which they could resort as often as they chose; here they amused themselves at all hours of the day, in dabbling around the edges of the pool, and in swimming and diving in the water; but they did not grow—they were subject to cramps and fits, and one after another died, till I began to think that water was not their proper element. I varied their food—gave them rice-flour, corn-grist, boiled potatoes, hominy, bran, and many kinds of vegetable food, but with the same results—and of a hundred young that were hatched, I scarcely raised a dozen. I then began to mix with their food various medicinal herbs, believing that this might correct some deleterious properties of their food, but it was to no avail. I next procured the different varieties of ducks for breed, thinking that perhaps one kind might be better suited to the climate and the confinements of the poultry-yard than another; but I was soon convinced that my want of success was not owing to my breed of ducks. Several years passed away and left me pretty much where I began, and I was almost ready to abandon any farther attempts at raising the duck.

The thought at last occurred to me that in the food with which we usually fed this species of poultry, we departed widely from nature, and that, although the old ducks in their wild state fed on rice and the seeds of various grasses that are found along the edges of the rivers, brooks and ponds, yet, that at the spring of the year, when the young wild-ducks are hatched, there are few seeds ripe, and it is questionable whether at that early age they feed at all upon grain or seeds. There appears in the digestive organs of these young birds something unsuited to this kind of food—it passes through them without affording much nourishment. I had ascertained by dissection that their gizzards were filled not with vegetable food, but with the fragments of small craw-fish, worms, and various aquatic insects, as well as the spawn of fishes, and I determined in the following year to try the effects of animal food. In due time my young ducks were hatched, beef was given them at first, after having been chopped very fine; this they devoured greedily, and eat it preference to all kinds of vegetable food. The effects upon their health and growth was immediate and surprising! They appeared to grow faster than any other poultry—in a few weeks they were out of danger, and in a few months fit for the table. As beef was expensive, I tried cheaper kinds of food, such as the haslet of animals, crabs, fishes, &c. The result was equally favorable. I was now satisfied that in the article of food the end is attained by simply following nature, and giving the young ducks animal food.

But although my experiment was thus far favorable, I found that many of my young ducks died after having been suffered to go in the dews and water, and that after many showers of rain they became thoroughly wet, and that when showers were succeeded by hot suns, they were subject to a disease of some apoplectic character, or a *coup de soleil* which killed numbers.—Here I was much puzzled. I had succeeded in one instance by following Nature, but I found that I could not carry my theory through, and that water affected the domesticated duck very differently from what it did the same bird in its wild state. The fact was not unknown to me that the down of young wild-ducks is almost impervious to water; they are exposed to dews

and rains—they dive to the bottom of pools and streams, and live in the water: yet they always keep dry—an oleagenous substance is spread over their feathers, from which the water glides off instantaneously and leaves the bird dry during all weathers. Not so with the young of the domesticated duck. Owing, either to the confinement of numbers in a small space, where their down becomes ruffled and displaced, or to their not being able to procure that kind of food which in the wild state is favorable to the secretion of that peculiar oil which is found contained in the glands of birds, and which serves to lubricate their feathers and protect them from the wet, the down of the young tame duck soon becomes thoroughly wet, and when this is once the case, it is subject to various diseases and is difficult to raise. To accommodate the young duck to that artificial state into which it had been thrown by domestication, I found it necessary to adopt some mode by which during the first few weeks of its life, (the only time in which it requires much care), it might be preserved from the effects of that element, which in its native state is almost its only residence, and furnishes the means of its subsistence. A little reflection enabled me to guard against the inconvenience and dangers which result from this state of domestication. I had my coops built pretty large and tightly shingled, so as to be impervious to water. The young ducks were not let out in the morning dews till the sun had dried the grass, and the vessels in which their water was placed were railed over, so that they could drink by inserting their bills between these little railings, but were prevented from getting into the water. After following these simple directions with regard to food and shelter, I found that by a little attention of a servant, I could supply my table with ducks the whole year round—that I seldom lost one in twenty, and they were free from all diseases. I raised from one hundred to three hundred ducks per year, and now found that they were the easiest of all poultry to raise. I communicated the result of my experiment to my friends. Those of them who had the disposition, the patience and industry, followed my directions, and in every instance met with the same success. I have their assurance, that they can now raise ducks in any numbers, and some of them have for the last two or three years supplied our markets with from three to five hundred ducks of the largest size and finest flavor.

After having carried my readers through this perhaps to them tedious detail of experiments which cost me much time and attention, but for which I was more than repaid by the successful result, I shall now proceed to give, under different heads, such simple directions as will enable our planters and farmers to supply their tables with this kind of poultry, which might be an object to those who are in the habit of supplying our markets.

1. *The species and varieties of ducks best adapted to the purpose of breeding.*—The only two species of ducks that are raised in this country are what are commonly called the English duck and the Muscovy duck. The English duck is a descendant of the wild duck that visits us every winter in such numbers, called the mallard *(Anas boschas)* is found also in Europe, and breeds in England, although not the largest, it is certainly among the finest flavored ducks in the world. The flavor of the famous canvass-back duck *(Anas Vallisneria)* that is found so numerously in the Chesapeake, and more recently in the Santee, and at the mouth of the Savannah river, is no doubt superior to it, but it is supposed that this is owing to the peculiar kind of root on which that feeds, believed to be the *Vallisneria Americana*—and that were it fed on common food its flavor would not be superior.

The English duck, which is so common in our yards, has from its long domestication, run into a number of varieties, which differ so much from each other as to appear like different species; they are of different sizes—of a variety of colors, and some are tufted. The variety to which I have usually given the preference, goes by the common name of the Madagascar duck, is distinguished by its being of the largest size—having a pretty long neck and almost invariably a light streak above the eyes, and usually a small streak extending from the lower part of the upper mandible to below the eye.

The Muscovy duck *(Anas Moschata)* is another duck more recently introduced, but which is now very common, and is well deserving a place in our poultry-yards. It was formerly, by most writers, considered as coming from the Eastern Continent, but is now well ascertained to be a native of South America. This duck, in our Southern climate is, perhaps, more hardy than the other—sets more steady on its eggs, and lays in the spring and fall. A mongrel breed between this species and the English duck is easily produced, and has become very common; but these, though they are good layers, are unable to propagate their species.

There are other species of ducks, which the curious in these matters have partially succeeded in domesticating. I once saw a fine flock of the Gadwall ducks, *(Anas strepera)*, which an individual, in the upper part of the State of New-York, had succeeded in raising from ducks which he had captured, and which bred freely in his yard, and made no attempts at flying away. Our beautiful Summer duck *(Anas sponsa)* breeds freely in some parts of France and in the Zoological Garden in England. But it is very probable that the two species mentioned are as well adapted to our purposes as any other, and that, for many years they will be the only ones which will be generally kept in our poultry-yards. One drake will answer for five or six ducks. Where mongrels are to be bred, place in a separate yard, one Muscovy drake to four English ducks.

2. *The best mode of procuring an abundance of Eggs.*—When ducks are raised in the country and have access to rice-fields, ditches, ponds, and the borders of rivers, they find food best suited to them and generally lay early and freely. But where they are necessarily kept in yards, and do not possess the above advantages, it will be necessary to adapt their food to their situation. A mixture of any kind of animal food with their rice-flour, corn-meal or grist, given them regularly and plentifully three times a day, will enable you to procure a great abundance of eggs; where this is neglected, your English ducks will lay but sparingly. I have observed that animal food is not so necessary to the Muscovy duck, but that they will lay pretty freely on being fed on grain alone.

3. *Setting and hatching the Eggs.*—The English duck, although a good layer, is very careless about hatching its eggs until late in the season. I have invariably used the common hen for that purpose; and when the young ducks are removed as soon as they are dry, their foster

parent will set again on other eggs; and I have thus known a single fowl to bring out three, and even four broods of young ducks in succession. In that case, she should be repaid for her faithfulness by being richly fed. The young ducklings, in this climate, leave the shell on the twenty-sixth day. The Muscovy set a few days longer. A fowl of a tolerable size will cover from thirteen to fifteen eggs. After the eggs have been four or five days under the hen, you may, in the evening, examine the eggs by the light of a candle or lamp. Place the eggs longitudinally between the fore finger and thumb. If the egg be likely to hatch, it will be of a dark color, with streaks of red frequently perceptible: and the cavity on the thick end will be somewhat enlarged and transparent. If it be a clear egg, it will be wholly transparent, and ought to be removed at once; and if it have not been kept too long in the nest, it is still fit for use. In this way, when several hens have been set nearly at the same time, it will frequently be practicable to remove a sufficient number of clear eggs, so as to place a fresh setting of eggs, under one or more of them. The Muscovy duck sets faithfully, and may as well be permitted to hatch her own young.

4. *Method of destroying fowl-lice.*—The insects which infest the setting hens may be easily destroyed by thoroughly sprinkling the nest, and wetting the fowl, even to the skin, with a strong decoction, made by pouring hot water on a handful of common leaf tobacco, mixed when cold with a table spoonful of spirits of turpentine, and double the quantity of gunpowder. It will be well, also, occasionally to take away their old nest and make a new one of fresh hay or straw.

5. *Duck-coops, food, and manner of rearing the young.*—Let your coop be made pretty large; say three or four feet in length and three in depth. Let it be well shingled, so as to exclude all water, and have a good pitch toward the front. Let it be tight on three sides and barred in front, with a slide below the lower bar, so as to retain the ducks in unfavorable weather. A space of ten or twelve feet square, formed of common boards set up edgewise, will, when you have not much room in your yard, suffice for fifty ducks. Keep making coops in proportion as your ducks increase in numbers, and endeavor to keep the different sizes separated. The first brood, early in the spring, requires for a few days, the warmth of the hen's body; and she should not be made to take care of more than twenty or thirty. A little later in the season, the young that are then hatched do not require the services of their foster-mother, and may from the beginning be placed in a coop by themselves, to the number of fifty. Young Muscovy ducks may be treated in the same way; and they and the mongrels and English ducks, may all be indiscriminately reared together.

As soon as your young ducks are hatched, let them be placed together, for a few hours, in a basket containing some warm inside lining; and when they have sufficient strength, place them with the hen in the coop. Feed them with meat, or animal food of any kind, chopped fine with a chopping-knife. For convenience, I have usually had it boiled. A little rice-flour or cornmeal may be mixed with it, and the latter may be increased, if you have but little meat. Let this be continued for three weeks, and they are out of danger and can be raised on any kind of food. Still it is to be observed that ducks in all cases thrive better on animal food, and where this can be conveniently obtained, it may as well be given them. Those planters who live near our sea-coast, by running a tight board fence across any small branch of salt water, and placing in the centre a fish-trap made of laths, can easily procure a sufficient quantity of fishes and crabs to feed all their young poultry. A man with a cast-net could in half an hour do the same. I have known persons in the interior of the country, substitute squirrels, rabbits, and even venison; and one gentleman fed his young ducks on he flesh of alligators, thus rendering that which was a nuisance, subservient to his profit. When your young ducks begin to be tolerably feathered on the sides, which will be in five or six weeks, they may then be turned into the common poultry-yard—always bearing in mind, that those which are best fed, and obtain most animal food, thrive the fastest.

I have not treated of diseases to which ducks are subject: since, by the above treatment, I have generally found them healthy.

As this is a long essay, and may be too great a tax on your readers to peruse, I would give in a single line, the substance of my directions for the successful rearing of young ducks:

Give them animal food and keep them dry.

EXPERIMENTER.

☞ For a long time, and in many forms that may not be readily traced to the time, the place, and the occasion, our readers will get the benefit, much or little, of our (to us) most gratifying tour among the hospitable sons and no less hospitable daughters of the South.

At Mobile, for example, as early as the 8th and 9th of April, at the table of C. M., Esq., one of the true old Virginia game breed, we feasted abundantly on *strawberries and peas!* Yet, after a lapse of forty-three days—this being the 21st of May—they have not been placed on the tables of the Hotels in New-York. This is mentioned to show the wonderful difference of climate in our vastly extensive and *extending* Country; but this is not what we would be at. At the same hospitable table we partook of a most excellent kind of *soup*, new to us, called "FRENCH GUMBO." The lady of the house (and what house or table was ever worth mentioning that had not a lady to govern and preside over it), gave us the following:

RECEIPT FOR FRENCH GUMBO.—Cut up one large fowl, season it with salt and pepper, drudge it well with flour; have ready a soup-kettle, put in a table spoonful of butter, one of lard, a handful of chopped onion; fry the fowl then to a good brown, add to this four quarts of *boiling* water, cover close, let it simmer two or three hours, then put in fifty oysters with their liquor, a little thyme and parsley: just before serving, stir in a table-spoonful of the *filee powder;* season high with cayenne pepper.

N. B. Cold turkey and beef-steak make also very good Gumbo.

The Filee or Felee (or however else it may be

spelled) is what gives a *mucilaginous* character and excellence to this soup. The powder consists of nothing more than the leaves of the sassafras *cured in the shade*, and then pounded and sifted; therefore, any family in the country can always have it in the house. It is on sale in the shops in the South. Thus, any one who will *take the pains* may, any day in the year have a tureen of most palatable and very nutritious soup, out of very ordinary materials.

☞ Some men pretend to despise these "small matters," but put them within reach of them and see how their *actions square with their pretensions!*

DESULTORY NOTES ON A VARIETY OF SUBJECTS.

THERE is in Edinburgh, connected with the Highland Agricultural Society, an "*Agricultural Chemical* Association," conducted by Professor Johnston.

The laboratory of this Association contains *seven apartments*, in which analytical operations are continually carried on.

It may serve to impress on the minds of those who think it a mere trifle to analyze any substance, and expect chemists to do it for no consideration, to state that, in this extensive laboratory, to analyze carefully three different oil-cakes, so that the Professor might feel perfectly confident of the result, it took him and two of his assistants *three months*. He has five assistants constantly employed. Some of the practical benefits to the farmer arising from the analysis of this single substance, oil-cake, are indicated by the propositions which will be found on another page.

Members of Congress may form some idea of what would have to be done in the Chemical Laboratories of a great National Institution, when they are told that, at this Agricultural Chemical Association, deriving no assistance from Government, there were 572 analyses made in the year. The subjects were: Guano and other manures; soils—stiff and fine clays; limestones and marls; iron and manganese ores; waters, turnips, oil cakes, refuse manufactures, potatoes; determination of nitrogen air, oats, barley, oil-cake, slates, and other rocks, ashes of oats, potatoes, (tubers and tops), wheat, barley, and oil-cakes. It is a curious fact that the Committee of this Agricultural Chemical Association in urging the propriety of a salary of a little more than $2,000 to Professor Johnston, refer to the "*risks incurred by him as a chemist of the Association.*" Among these risks, say they, "exposure to actions of damages, for advice given to members, should not be lost sight of. During the last six months, an action was raised against him for an opinion given at one of the monthly meetings, as to the value and use of an English artificial manure, the effect of which was alleged to be a depreciation of the price of the compound, and for which damages to the extent of fifty thousand dollars were claimed. Professor Johnston offered to make for the patentees, in order to verify his opinion, a minute analysis of the substance, provided they would agree to publish the same. *Since that offer he has heard no more of the action.*

Here, again, Members of Congress may have an inkling of what the Smithsonian Institute could do for Agriculture, if the prominent feature of its organization *looked that way!* Not only might farmers get every substance and earth analyzed, but here they would have the means of clipping the wings of various humbugs that are let loose, in succession, one year after another, to amuse or fleece the agricultural or horticultural communities. But we should remember they are not agriculturists or horticulturists that most efficiently electioneer in the pot-houses!

Suppose half as much to be taken out of the Treasury for the diffusion of agricultural knowledge, and the construction of agricultural highways, as is done annually for the warlike machinery of the *Republic!* Why, for *military surveys* alone it is proposed to pay more than $100,000 next year!

In illustration of the advantages derived from the Scotch Association, one practical farmer specifies a case in which Professor Johnston, on application, showed him how he could himself make a certain manure, which he was about to buy, at a cost so much less than it was sold for, as to save him $100 on the quantity he should have purchased at that time. The same Lothian farmer says: "I have no doubt the day is not far distant when an intelligent agriculturist will, on entering a farm, obtain correct analyses of his soils and subsoils of the manures he uses, and of the crops he rears. In this way he will be able to keep such a Dr. and Cr. account, between his soils and manures on the one hand, and his produce on the other, as will enable him to know what substances to apply so as, with the assistance of the mechanical improvements of the soil, to produce an amount of animals and vegetables, from a certain breadth of land, which even the most sanguine hardly dares to hope for!" And he might have added that it would be in the power of the farmer, by these means, to calculate, with a good deal of accuracy, how much his land is gaining or losing in fertility

from year to year. Who doubts that this might have been done before now, if public men could be brought to legislate for the general, instead of for particular interests?

ABSTRACT FROM THE RETURNS OF AGRICULTURAL SOCIETIES OF MASSACHUSETTS.—We are indebted to Mr. DODGE, of Hamilton, for this interesting compilation. In our next Number we shall publish Mr. Phinney's "Description of the stock recently imported by the Massachusetts Society for Promoting Agriculture: accompanied, perhaps, with some notes of the Editor of the FARMERS' LIBRARY.

We are not surprised to find such a man as Mr. P. concurring, apparently, in what we have suggested as the worthlessness of many of the stereotype premiums offered by Agricultural Societies, and their utter inefficiency in diffusing old or producing *new knowledge*—or in effecting any general or permanent improvement in the branch of industry to which those premiums are applied.

Without intending here to anticipate what we may have to say on this Report of Mr. P., we take room to extract his remark on the effect of annual premiums for *best milch cows*:

"Thousands of dollars have been offered and awarded in premiums for the best milch cows within the Commonwealth, during the last *twenty years*; and, as appeared to the Trustees, to *very little benefit*. Whoever has attended our cattle-shows may have occasionally met with a cow, remarkable for her milking properties, which the fortunate owner purchased from some drove. This accidental cow is exhibited at the cattle show; well authenticated proofs of her great yield of milk or butter are produced; the owner takes the highest prize, and puts the money in his pocket; the calf is sold to the butcher, and the cow the next year is put into the beef barrel. And this has been the beginning and the end of most of the native cows to which the highest premiums have been awarded."

"The breeds of cattle," says Mr. P., "which the Trustees believed, under all the circumstances, to be best adapted to this country, best calculated to promote the object they had in view, and to *subserve* the objects and wants of the farmer, were the Ayrshire and the North Devon." His reasons will appear in our next.

PRICES CURRENT.

[*Corrected, May 23, for the Monthly Journal of Agriculture.*]

ASHES—Pots, 1st sort	℔ 100 lb.	3 75	@— —
Pearls, 1st sort, '45		4 06½	@— —
BEESWAX—American Yellow		— 29	@— 29½
CANDLES—Mould, Tallow	℔ lb.	— 9	@— 11
Sperm, Eastern and City		— 26	@— 38
COTTON—From	℔ lb.	— 6½	@— 10
COTTON BAGGING—American		— 12	@— 13
CORDAGE—American	℔ lb.	— 11	@— 12
DOMESTIC GOODS—Shirtings	℔ y.	— 5½	@— 11
Sheetings		— 7	@— 15
FEATHERS—American, live		— 25	@— 32
FLAX—American		— 7½	@— 7¾
FLOUR & MEAL—Genesee	℔ bbl.	4 56½	@— —
Troy		— —	@— —
Michigan		4 50	@— —
Ohio, flat hoop		4 50	@— —
Ohio, Heywood & Venice		5 25	@ 5 37½
Ohio, via New-Orleans		4 37½	@ 4 50
Pennsylvania		4 50	@ 4 62½
Brandywine		5 —	@— —
Georgetown		4 50	@— —
Baltimore City Mills		4 50	@— —
Richmond City Mills		6 —	@ 6 25
Richmond Country		4 62½	@— —
Alexandria, Petersburg, &c.		4 50	@— —
Rye Flour		3 —	@ 3 12½
Corn Meal, Jersey and Brand		3 25	@ 3 50
Corn Meal, Brandywine	hhd.	— —	@16 —
GRAIN—Wheat, Western	℔ bush.	— 93	@ 1 11
Wheat, Southern	new	— 90	@— 95
Rye, Northern		— 66	@— 67
Corn, Jersey and North	(meas.)	— 67	@— 69
Corn, Southern	(measure)	— 60	@— —
Corn, Southern	(weight)	— 60	@— 61
Oats, Northern		— 42	@— 43
Oats, Southern		— 35	@— 37
HAY—North River	bales	— 68	@— 80
HEMP—American, dew-rotted	ton	80	@100 —
" " water-rotted		.120	@170 —
HOPS—1st sort, 1845		— 20	@— 25
IRON—American Pig, No. 1		35 —	@37 —
" Common		25 —	@30 —
LIME—Thomaston	℔ bbl.	— 75	@— —
LUMBER—Boards, N.R.	℔ M. ft. clr.	35 —	@40 —
Boards, Eastern Pine		11 —	@13 —
Boards, Albany Pine	℔ pce.	— 10	@— 19
Plank, Georgia Pine	℔ M. ft.	32 50	@35 —
Staves, White Oak, pipe	℔ M.	50 —	@— —
Staves, White Oak, hhd		40 —	@— —
Staves, White Oak, bbl		30 —	@— —
Staves, Red Oak, hhd		25 —	@— —
Hoops		25 —	@30 —
Scantling, Pine, Eastern		— —	@16 25
Scantling, Oak		30 —	@35 —
Timber, Oak	℔ cubic foot	— 25	@— 37
Timber, White Pine		— 18	@— 25
Timber, Georgia Yellow Pine		— 20	@— 22
Shingles, 18 in.	℔ bunch	1 75	@ 2 —
Shingles, Cedar, 3 feet, 1st quality		— —	@24 —
Shingles, Cedar, 3 feet, 2d quality		22 —	@23 —
Shingles, Cedar, 2 feet, 1st quality		19 —	@— —
Shingles, Cedar, 2 feet, 2d quality		16 —	@18 —
Shingles, Cypress, 2 feet		13 —	@14 —
Shingles, Company		— —	@29 —
MUSTARD—American		— 16	@— 31
NAILS—Wrought, 6d to 20d	℔ lb.	— 10	@— 12½
Cut, 4d to 40d		— 4	@— 4½
PLASTER PARIS—℔ ton		— —	@ 3 —
PROVISIONS—Beef, Mess,	℔ bbl.	7 —	@ 7 50
Beef, Prime		5 —	@— —
Pork, Mess, Ohio		— —	@11 —
Pork, Prime, Ohio		8 75	@ 8 87½
Lard, Ohio	℔ lb.	— 6	@— 7
Hams, Pickled		— 4	@— 5
Shoulders, Pickled		— 3¾	@— 4
Sides, Pickled		— —	@— —
Beef, Smoked	℔ lb.	— 5½	@— 6
Butter, Orange County		— 15	@— 16
Butter, Western Dairy		— 10	@— 14
Butter, grease		— 6½	@— 7½
Cheese, in casks and boxes		— 7	@— 8
SEEDS—Clover	℔ lb.	— 6½	@— 8
Timothy	℔ tierce	10 —	@15 —
Flax, Rough		9 —	@— —
SOAP—N. York, Brown	℔ lb.	— 4	@— 6
TALLOW—American, Rendered		— 7	@— 7½
TOBACCO—Virginia	@ lb.	— 3	@— 6
North Carolina		— 3	@— 5
Kentucky and Missouri		— 3	@— 7
WOOL—Am. Saxony, Fleece,	℔ lb.	— 38	@— 40
American Full Blood Merino		— 35	@— 37
American ½ and ¾ Merino		— 29	@— 32
American Native and ¼ Merino		— 26	@— 28
Superfine, Pulled		— 28	@— 30

Extracts from the Critical Notices published in England during the publication of the work in London.

From the London Times.

"The first part or number of this work has just been published by Messrs. Blackwood. It is written by Mr. Henry Stephens, a gentleman already known to the public in his editorial character in the Quarterly Journal of Agriculture. The great merit of the work, as far as it has yet gone, is the intelligible manner in which it is written, and the strong good sense with which it is distinguished. The proposed arrangement, set forth in the plan of the work, is clear and satisfactory: and the whole number is valuable as being the result of practical experience and competent theoretic knowledge. It is a book which will be received with gratitude by those who are really anxious to profit by instruction, and whose anxiety for improvement is not impeded by prejudice." . . . "The plan of the work, it may again be observed, is very good—the reasoning is logical—the assertions are the results of accurate examination and repeated experience. In addition to the information conveyed in the letter-press, the book is ornamented by accurate and handsome plates of agricultural animals, implements of farming, plans of farming, &c. &c."

From the Newcastle Courant.

"Mr. Stephens's work is divided into three portions. In the first, the pupil is shown the difficulties he has to encounter in acquiring a competent knowledge of farming as a profession, and the most easy and effectual methods of overcoming these. The second portion details the various kinds of farming practiced in the country, and points out that which the Author reckons the best for adoption under given circumstances.—The third and concluding portion accompanies the young farmer into the world, where it acquaints him how to look about for a proper farm for himself."

From Felix Farley's Bristol Journal.

"When we say that the Author is Mr. Henry Stephens, we are safe in expressing our conviction that the results of his penetration, judgment, and experience, so placed before the public, will confer an advantage on the agricultural interest of no common order. We therefore predict a large measure of success to the intended work."

From The Argus.

"We regard it as a national work; and, from the masterly manner in which Mr. Stephens handles his subjects, we feel assured it must become a standard one. His thorough practical knowledge, backed by his scientific acquirements, makes the Author's fitness for the task conspicuous; and the unpresuming manner in which his talent is displayed enhances its value still more in our eyes."

From the Midland Counties Herald.

"The entirely practical nature of this work, and the evident care with which it is produced, will, we think, render it one of the most useful publications for the farmer which has yet appeared."

From The Times.

"The great merit of the work, as far as it has yet gone, is the intelligible manner in which it is written, and the strong good sense with which it is distinguished. It is a book which will be received with gratitude by those who are really anxious to profit by instruction, and whose anxiety for improvement is not impeded by prejudice.

From the Birmingham Advertiser.

"The farmers of England would do well to possess themselves of this work, for the variety of useful information, and the many practical suggestions it contains."

From The Britannia.

"The two parts now before us are models of clear, sensible composition, and form such an introduction to the practice of farming as has never been published before. The author brings to his task a large store of knowledge, sound sense and a lucid style." "We are quite sure that never was any work more called for, by the intelligence of the age than this 'Book of the Farm,' and believe that it could not have been entrusted to more competent hands, or produced in better style. We strongly recommend it to all classes of agriculturists as a publication of decided utility, and likely to be most serviceable to them in the successful prosecution of their labors."

From the Sporting Review.

"The work before us is one of the most practical results of so patriotic a spirit. It is a most welcome addition to our rural literature. As it proceeds, we hope to transfer some of its good things to our pages.

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