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AGRICULTURAL.

From the Cheraw Gazette,

FAIRY HILL, NEAR CHERAW, S. C.
20th February, 1852.

My Dear Sir:

You desire me to write out some account of an experiment with Guano made by me the past season, with such suggestions as might be serviceable to you in conducting a similar one upon the ensuing crop. My acquaintance with this article, as you are aware, is too limited to enable me to prescribe with certainty the best rules for its application and management; but as far as my experience extends, it affords me pleasure to furnish you with such facts as have come under my observation, leaving you to make such deductions therefrom as to you may seem reasonable and legitimate.

I used a small quantity of Guano (Peruvian) last spring for the first time. To satisfy myself of its value, I applied it, alone and in combination, to almost every production both of the field and garden, and to different descriptions of soil; and each application was followed by such marked effects as to fully meet my expectations. But in one instance only did I give that attention to the details that would justify my reporting it as a well conducted experiment. The piece of land selected was the central portion of a field situated on the river ridge, of light, sandy soil, (known as isinglass or micalands) and of nearly uniform fertility. The time of application was at the first plowing of the corn, and the manner was as follows:

A narrow shovel plow was run round the corn as closely and deeply as practicable, and in this furrow track, a level table spoonful of Guano was deposite opposited each hill. The hands engaged in this operation were directed in depositing it to scatter it 6 or 8 inches in the furrow, but to suffer none to fall out of it.—To three rows it was applied as above described, and to three contiguous ones the same quantity of a mixture, composed of 3 parts in bulk of Guano to 1 of Plaster; and thus alternating throughout (first G. then the mixture) the whole plat was manured. A turn plow followed immediately which covered it so deeply as not to be disturbed in after culture. On either side of this plot a few rows were left without manure, and the balance was cotton-seeded at the rate of 20 bushels to the acre. The quantity of Guano used above, when alone, was 55 lbs., and when in combination with Plaster, 41 lbs. to the acre. And as a "table-spoonful" does not convey a very accurate idea of quantity, it may not be improper to state that the capacity of the one used by me was about ½ ounce. The whole field received the same culture.

In a few weeks after the application, the weather being seasonable, the most striking effects were observable; the corn, where the Guano and mixture were used, assumed the dark, green color peculiar to the best bottom lands, and soon over topped any other portion of the field. It continued to grow finely, and promised a very largely increased yield until about earing time, when it suffered so seriously from drouth that I was induced to believe that the beneficial effects of the manure, were to a great extent, if not entirely lost. To satisfy myself, however, beyond a doubt, I took two hands into the field about the last of November and gathered a number of contiguous rows as treated above, (weighing being more accurate than measurement) each row separately, and the result was as follows:—Guano alone at a cost of $1 65 per acre (55 lbs. a 3 cents per lb.) as compared with the unmanured portion increased the production 3 bushels; in combination with Plaster at a cost of $1 33 per acre, as compared above, increased it 6 bushels per acre. This result was uniform in a number of comparisons.—The cotton-seed gave better yield than the Guano alone; but when compared with the mixture the result was variant; in one instance the cotton-seed had the advantage,—in an other the mixture; the difference being so small in each trial as to leave me in doubt to which of the two a preference should be given. When, however, the relative cost of the two applications ($1 33 and $2 00) are considered, it would not seem unreasonable to infer that Guano when thus combined, is at least as cheap at 3 cents per pound as cotton-seed at 10 cents per bushel.

From the above experiment it would appear that Guano, when used alone, will not repay the planter the cost of its application when corn commands less than 55 cents per bushel; but when combined as above it may be profitably employed everywhere in the cotton States, as corn can be grown with it for a small fraction over 22 cents per bushel—a sum much below the average price of this article. It was with this last result that I was most highly pleased, as it obviates to some considerable extent the only valid objection to its use—its market value—for Plaster costing but a trifle, not only cheapens the manure but adds greatly to its efficiency.

That Guano is a powerful fertilizer is beyond a doubt; but whether it is adapted to *our* soil and productions, and if so, whether the high price at which it sells, will admit of its profitable employment as a means for renovating our lands, are questions of importance to the planting community. It is not pretended that the small trial above, by any means, determines these important questions; for in agricultural matters especially, where there are so many circumstances to be considered, ever varying and each tending to change or modify the result, no one experiment, however carefully conducted, can certainly establish a single fact. All that can be claimed for it, therefore, is, that it raises a probability in its favor, sufficiently strong to warrant further and more extended experiments. Accordingly, I have procured and intend using the present year more largely of these articles; and in lieu of the suggestions you desire me to make, I will give you, as far as my space will allow, some idea of the manner in which I intend applying it.

On cotton land I shall use from 150 to 200 lbs. per acre; deposite it in drill, as is usual with other manures, alone and in combination. Before using it, however, all the lumps should be carefully reduced so that the whole may be passed through a seive, and to secure regularity in spreading it, it has been found advantageous to combine it with other manures. Vegetable mould, saw dust, and charcoal, are recommended to be suitable substances with which to compost it; but the latter, however, is perhaps to be preferred to all others, as it is a good absorbent, deprives Guano of its unpleasant odor, and is of itself on some soils a good manure. Whatever the substance may be that is to be used in combination with it, it should be perfectly dry; or if wet, the compost should be buried as early as possible, as moisture produces immediate decomposition and thereby disengages those gasses which constitute its chief value. For this among other reasons, it is not deemed judicious to compost it with stable or barnyard manure. I intend combing it with Plaster in the proportion of about 25 per cent. in bulk of the latter, which would not vary far from 50 per cent. in weight; with charcoal (the quantity depending on the amount at command) and also with common salt in minute quantity.

Another way in which I intend using it on cotton, is to make a solution of it in about the following proportion:—to every pound of Guano, add 10 gallons of water. Small as this quantity seems, I am induced to believe from a small trial which I made last year, nearly similar to this, that it would prove to be highly beneficial in imparting an early and vigorous growth to the young plant. This steep should be applied to seed immediately before planting, and whilst wet with it, they should be rolled in Plaster. One bushel of the latter to 25 or 30 of seed, is about the quantity which the *lint* will take up.

On corn I intend using ½ ounce to the hill; depositing it near the grain—but not in immediate contact with it, as from its highly caustic nature it would doubtless destroy it—and as deeply as practicable. The steep mentioned above might be used on this grain also with advantage, not only in hastening the germination, but in rendering it unpalpable to crows. This steep tastes no better than it smells, and as soon as they find that out they will quit the field. They are sensible birds; and here is the proof of it:—A farmer being greatly annoyed by them, soaked corn in spirits, and exposed it where they frequented; they ate, got tight and (as a matter of course) made a mighty fuss He renewed his bait, but could never deceive them afterwards. A crow never gets drunk a second time.

The only danger to be apprehended of a failure in the use of Guano is from a drouth: hence the advantage of combining it with such substances as are good absorbents or or that possess strong affinity for water; and hence, too, the propriety of depositing it deeply, as early in the spring as practicable. One great advantage which it possesses over all other manures, is that its strength is concentrated in so small a compass as to make the labor of taking it to the farm and depositing it, comparatively trifling. All the manures used by us are bulky and heavy; and besides that, we are all the year round accumulating them, several months of spring of most laborious work, are spent in carting and applying them. If the time and labor employed in this operation were properly estimated, I doubt not that the cost of transportation alone, where the field is remote from the horse lot, would at least be equal to a pretty fair dressing of the same field with Guano!

I have thus, my dear sir, given you, though very imperfectly, some account of my experience with Guano, with such suggestions as I thought it prudent to make. Others will readily suggest themselves to your mind, which you can subject to the test of trial. As you and a few others intend using this article on the ensuing crop, it is hoped that you will carefully note the particulars, that a number of experiments, all bearing on one point, may definitely determine the question, whether or it may be profitably used in this latitude.

Yours truly,

JOHN W. LEAK.

CULTURE OF ASPARAGUS.

There is scarcely a garden plant less understood than Asparagus. Many who know and appreciate its great delicacy as a table esculent, look upon it almost as forbidden fruit, from its supposed rarity and difficult culture. Nothing can be farther from the truth. An humble seashore plant, braving the salt waves, winter's cold and summer's heat, it has been brought into the garden, acclimated and tendered, until it holds the first rank among the vegetable luxuries of the table. But it takes three years to mature from the seed, before it can be cut for the table, and this is the bugbear. There is no crop easier of culture, and none that pays more in the amount of nutritious food, than the Asparagus bed; admitting that it takes three years to get the first bite. The seed may be planted in any good garden soil in February or March, in drills, and as the plants come up and grow, keep them well worked with the hoe; the roots will be sufficiently large by fall and winter to transplant. The plant will grow in any kind of soil, but as its delicacy and tenderness come from its rapid growth, it should have rich soil; it will bear almost any quantity of manure, and delights in a sandy soil; as it is a seashore plant, it also delights in salt and a top dressing of salt over the bed, at least, twice in the season, will keep down all the grass and weeds and invigorate the plants.

It has been supposed absolutely necessary to transplant Asparagus, and to have beds trenched and bricked up at the bottom and sides; but any good garden soil that will bring beets or cabbages will bring good Asparagus. It may be made just as much better as the gardner may think proper to manure. In transplanting for a bed, plant the roots about eight inches by ten; cover the crown but about two inches; keep down the weeds by the application of salt. Work in a good coat of manure in the winter, and you may commence cutting the tender stalks the next spring; cut just below the surface of the ground, and the same stalks may be cut many times in the season; To those who do not wish to transplant, plant the seed in good soil, and work them as directed for the roots, and the third year the stem may be cut for the table. One great advantage in cultivating this plant, is its earliness; coming before English peas or snaps, and continuating for a long time. It is the first harbinger of spring, and is to herbivorous man, what the tender grass of spring must be to the longing cattle. Whoever owns a garden spot, plant an Asparagus bed; it is a cheap, healthy luxury, and should be within the reach of all who crave the early treasures of Spring.

Soil of the South.

FLAX COTTON.

New-York, *March 1st*, 1852.

TO THE AGRICULTURISTS AND CAPITALISTS OF THE UNITED STATES:

The subject of Flax Culture in the United States, and its preparation by the Chevalier Claussen process for spinning on cotton and woolen machinery, engrosses at present a considerable share of attention amongst nearly all classes of the community.

Hitherto we have been dependent on foreign importations for supplies of both the raw and manufactured article. The immense amount of labor expended on Flax, from the time it is sown till it is prepared for spinning on flax machinery, has been such as to preclude the possibility of raising it to advantage in competition with the foreign. Formerly, when raising Flax for spinning, it was necessary to pull it before seeding, or, when allowed to seed, the straw was thrown away as useless; but by the Claussen process, both straw and seed are equally valuable, and the old mode of pulling can be substituted by mowing or by the reaping-machine.

The soil best suited for its growth is a black loam, having a substratum of sand or clay.—It grows on almost all kinds of soil; even on the sides of gravelly hills, good crops have been raised, but the latter kind of soil is better for seed than straw. Deep ploughing and thorough cleaning are essential to its healthy growth. Many consider Flax to be a very exhausting crop, but English and Scoth farmers have found by experience that it does not impoverish the soil near so much as wheat. No soil, with the exception of our Western prairies and valleys, will bear cropping year after year with the same kind of grain, without returning to the soil a portion of the principal ingredients extracted from it. Flax can be raised annually on the poorest description of soil, provided it is manured with the excrescents coming from animals fed on flax-straw and oil-cake or oil-seed mucilage.

A practical English farmer gives the following as the result of his experience in Flax-growing: Quantity sown to an acre, 2½ bushels. Quantity of seed raised to the acre, 20½ bushels. Amount of straw, 2½ tons.—Even 22 bushels of seed and 2½ tons of straw are not considered a heavy yield.

The *Indiana Journal* says: "A farmer in Preble county, Ohio, this season raised 63 bushels of Flax-seed on 3 acres and 10 roods of ground, being over 22½ bushels to the acre. This, with the prospect of Flax Cotton manufacturing in this country, will indicate a prosperous business."

I know of no crop more profitable for a farmer to raise at the present moment than that of Flax. Say that he could raise no more than 18 bushels to the acre, and 1½ tons of straw, and calculating the former at $1.25 per bushel, and the straw at $5 per ton, and deducting 2 bushels for seed, it would amount to $29,25 per acre. If the farmers in this country could be prevailed upon to sow more seed to an acre, the results would be found well worthy of trying the experiment. If the Archangel and Riga seed can be had, I would recommend its use for the first sowing.

It is the intention of one of our most extensive farmers in Indiana (Henry L. Ellsworth, Esq., late Commissioner of Patents) to sow 500 acres under Flax the coming spring, and a proprietor in England is now preparing 3000 acres reclaimed from the sea, for the same object. In Great Britain and Ireland, not more than 150,000 acres were sown under flax during the past year, whereas her manufactures consume the growth of 700,000 acres. The guaranty given by English Flax Cotton Companies and Proprietors to the farmers to purchase their Flax of them at fair rates, has induced the latter to double the extent generally laid aside for that object.

The quantity of linen goods imported into this country in the form of shirtings, drillings, duck, thread, &c., is hardly credible, as well as of lin-seed for crushing, and linseed-oil, &c. Now, while provided with so bountiful a soil as this country is blessed with, and having no rack-rents to pay, as the English and Irish farmers have, I see no reason why we should not be exporters rather than importers of the above-mentioned articles. The quantity of oil-cake alone which England would purchase of us, would amount to several million dollars.

It is with pleasure we look round and see the few Linen Thread Factories that have sprung up in the States of New-York and Connecticut within the past year or two. There is F. W. Farnam & co., of Cohoes, who received a gold medal from the American Institute for Tailor's Thread, at the last Fair; the Lancaster Company; Willimatic Linen Company, whose Shoe Threads surpass any imported: Smith, Dove & Co., Andover, Massachusetts, and several other Shoe Thread manufactories; all of whom depend more or or less on European countries for supplies of Flax. A Company has been recently organized for manufacturing Linen Fabrics at Fall River, with a capital of $500,000, and it is to be hoped many more will follow their example.

No person who has seen the samples of Flax Cotton exhibited by Mr. E. G. Roberts, 68 Pine street, (on of the proprietors of Chevalier Claussen's patent for this country,) as well as of Clothe, Hoisery, &c., manufactured therefrom in connection with wool and with cotton, and by itself, but will be at once convinced of the feasibility of carrying out the Claussen process in the United States, and becoming independent of foreign importations of the coarser kinds of Linen Goods, and the adaptation of Flax Cotton to mix with wool or cotton.

For information regarding the process of converting Flax into Flax Cotton, and the cost of cottonizing it, I refer you to the following account taken from the *London Morning Chronicle*, dated December 5, 1851, of an exhibiton of the process at the Chevalier Claussen's Flax Cotton Works at Stepney Green, near London:

"OPENING OF CHEVALIER CLAUSSEN'S FLAX-WORKS AT STEPNEY.

"It is now about twelve months since we first announced the fact of several important inventions in connection with the preparation and manufacture of Flax, the principal of which was a mode of treatment by which the fibre could be so prepared as to be spun either alone or in combination with cotton, wool, or silk, upon the machinery at present employed in the manufacture of yarns and fabrics formed of those substances. At that period the operations were but experimental in their character; as, however, the whole of the chemical and manufactory processes were fully and completely explained to us, we were convinced, as well from their extreme simplicity as from the beauty of unerring principles upon which they were founded, that the object sought would ultimately be most satisfactorily obtained. Considering the immense benefits which the invention, if carried out, would confer upon the great agricultural and manufacturing interests, as well as the laboring classes of the country, we were disposed to consider the discovery of the Chevalier Claussen as one of great national importance, and watched with peculiar interest the progress of its development. Our statements of the successes which attended the various experiments were received at first with a considerable amount of incredulity by many who conceived that they had already attained to the highest state of perfection, and that further improvement in the preparation of Flax was impossible. The talented inventor was called upon to contend with a larger amount of opposition and difficulty than even usually falls to the lot of those who by their inventive genius are the most worthy benefactors of a country.

"The flippancy, however, of some acquainted but superficially with the subject, who denied every thing, but disproved nothing; the rashness of others, who, under the pretence of excessive caution, condemned without inquiry; the determined hostility of the interested, and the obtuseness of the ignorant, have, however, now almost completely passed away. The Chevalier Claussen was evidently not a man to be easily 'put down,' nor readily daunted by trifles, beneath which thousands of others might have succumbed. Although, for reasons which we need not now explain, and of which few are more heartily ashamed than the jurors themselves, the inventor of a process which would relieve our manufacturers from their present state of dependency upon foreign countries for the supply of their raw material; open to our agriculturist a constant and remunerative market for a new and valuable crop; and assist in providing the means of constant employment for the laboring population, and a consequent diminution of the burden of pauperism, was not considered worthy in the late 'Great Industrial Exhibition' of a higher honor than that awarded to the exhibitor of 'a box of sweetmeats' or a bottle of 'lamb's-tail oil,' M. Claussen, nothing daunted, and conscious of the value of his invention, proceeded quietly and unaided to fit up with steam and the necessary apparatus extensive premises formerly occupied as the work-house in Stepney Green, for the purpose of illustrating not only the practicability of his plan, but to challenge the most searching investigation into its commercial value. The whole of these arrangements were yesterday completed, and cards of invitation were issued, among others, to the following noblemen, eminent members of scientific professions, and others interested in the promotion of an extended Falx culture in the country:—Sir James Graham, Baron Rothschild, John Bright, M. P., Richard Cobden, M. P., H. Hope, M. P., J. A. Smith, M. P., Abbott Lawrence, Esq. (American Minister,) the Lord Mayor, Alderman Wire, Alderman Thompson, M. P., Sir W. J. Hooker, Bart., Sir R. Brown, (British Museum,) Sir C. Lyell, Professor Faraday, Dr. Lindley, Dr. Lyon Playfair, Professor Wilson, Morrison, Dillon & Co., G. Grove, (Society of Arts,) J. Hudson, (Royal Agricultural Society,) R. Hunt, (Museum of Geology,) M'Farlane & Stapley, G. R. Porter, (Board of Trade,) and numerous others, nearly one hundered of whom availed themselves of the invitation.

"The visitors began to arrive shortly after twelve o'clock, and were introduced to M. Claussen in a waiting-room, were Dr. Ryan shortly afterwards, and preparatory to the examination of the works, in a very able and interesting address stated the main points of the invention, and upon a small scale showed each of the chemical processes to be afterwards examined. Upon leaving this apartment, the whole body of visitors, headed by the inventor and Dr. Ryan, proceeded to the 'sample-room,' which was filled with samples of the fibres in each of the stages of manufacture, unbleached, bleached and dyed, of every hue and shade of color, and fabrics of various kinds formed of the yarn into which they had been converted. They were examined with great interest, and at the request of Sir W. Hooker, an ample selection was made, for deposition in the Museum of the Botanical Gardens.—From the sample-room, the visitors proceeded to the 'breaking and cleaning-room.' In order to the proper understanding of the process here adopted, it may be necessary to say that the stem of the Flax Plant, as it comes from the field, consists of several perfectly distinct parts: There is the woody substance of straw which supports the plant while growing, the fibres which lie upon the surface of the straw, and the glutinous and other matter, which cause the fibres to adhere as well to each other as to the straw. Of these three parts, the fibre only is the portion required for manufacturing purposes. The object, then, of this breaking or partial cleaning, and which may be called the preparatory stage in the process, is to reduce the bulk and weight of the material to be afterwards operated upon, to render its transport less costly to the grower, and also to permit him to retain a portion as chaff, useful for mixing with other cattle food; the returning to the soil a large proportion of the crop, which hitherto has been entirely abstracted from the soil, or rendered valueless by the process of steeping. The manufacturer or person employed to prepare the Flax for him also derives an advantage from the arrangement, inasmuch as he is enabled to steep a larger proportion of pure fibre than formerly in the steeping-vats, and the chemical agents employed, whether fermentative or otherwise, are enabled to act more rapidly and more directly upon the fibre than when it is in its whole or unbroken state. It is also adapted in this stage for manufacture into Canvas, Sail-cloth, Cordage, and other coarse kinds of fabrics. In the same room were two cutting machines for reducing the length of the fibre when required for preparation for cotton or woolen machinery.

"Having shown the means by which the Flax required for steeping was prepared, the visitors were led into the steeping-rooms, where Dr. Ryan exhibited some Flax in the course of boiling and steeping in cold water, in the unbroken as well as broken state. When boiled, the period of operation is about four hours; when steeped in cold solution of caustic soda, it is not sufficiently steeped in less than twenty-four hours. By the present mode of steeping, the period occupied rages from three days to six weeks. The contents of one of the vats having been sufficiently boiled, it was taken out and placed in a box slightly acidulated with sulphuric acid. After drying, the fibre was fitted for the further process of scutching and cleansing.

"Having gone through the whole of the steps required to produce the fibre for the linen manufacturer, the 'cottonizing' process was next explained. The Flax having been partially cleaned and boiled, precisely as in the case of the long fibre, it was placed in the first of a series of six vats containing a cold solution of soda and water, in which it remained till fully saturated. Thence it was removed into vat No. 2, with a solution of sulphuric acid, were it remained as long as any bubbles of Carbonic acid rose to the surface. It was in this vat that what is called the 'splitting process' takes place, and where the mechanical action of chemical forces is so beautifully illustrated. The effect was almost instantaneous. The character of the Flax fibre became at once changed from that of a damp aggregated substance to a light expansive mass of cotton-like texture. Its specific gravity was completely altered, and the mass, which at first lay submerged beneath, gradually floated like an expanding sponge to the surface of the fluid. The result was generally and loudly cheered by all present. For the purpose of removing any superfluous acid, and to carry the separation a stage farther, the fibre was immersed in a second vat of a weak solution of carbonate of soda. It was then ready for washing, carding, and spinning, in the same manner as ordinary cotton.

"A third, equally interesting and not less important process shown, was that of bleaching fibres, yarns, and fabrics. Under existing systems, the time consumed in bleaching a piece of linen occupies from three weeks to as many months. Under the Chevalier Claussen system, the period required is not more than as many hours, while the chemical ingredients employed, so far from injuring the material, greatly improve its quality. The rapid change in the color, as in the previous instance, of the texture of the substance, was warmly applauded.

"The bleaching process concluded, the visitors were shown into the 'carding-room, where a number of machines, such as 'devils,' 'carders,' and others usually employed in the respective branches of manufacture, were shown at work.

"We may state that jute, hemp, and various other fibrous substance were shown to be capable of being treated upon the above process, and that, in answer to several questions, it was stated that the 'Flax Cotton' and 'Flax Wool' could be prepared at prices not exceeding 3*d*. per pound.

The profits to be obtained from the preparation of Flax Cotton are such as to offer the greatest inducements for persons to embark in the undertaking, as shown in the following estimate of the cost of production and value of the article:

Five tons of Flax Straw, at $10	$50 00
Ingredients employed, Labor and Interest on Capital invested,	60 0
	$110 00
One ton of Flax Cotton, 10c. per lb.	200 00
Profit on 1 ton,	$90 00

In England, where they have to pay at the rate of from $15 to $20 per ton, the cost of production is only 6c., and the market value of it in the prepared state is 12c., leaving a profit of 100 per cent.

I am credibly informed that abundance of Flax Straw can be had in Ohio at $5 per ton. When farmers find it profitable for them to raise Flax on account of the seed alone, and place no value upon the straw, I think it would lie within bounds to base our calculations on obtaining straw for Flax Cotton purposes at $5. You will perceive that in the above statement I value Flax Straw at $10, which is the maximum price paid for it in this neighborhood.

The Scotch patent has been sold for 25,000*l.* sterling ($125,000,) and from good authority I learn that double that amount has been given for the French patent. Mr. E. G. Roberts has sold the right in this country for the States of Maine, New-Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New-York, and Illinois, and is negotiating with several parties for other States.—Applications have been received for every State in the Union, even Oregon not excepted.

ALLAN CAMERON.

PROF. EMMONS' LECTURES.

Prof. Emmons delivered Lectures on Friday and Saturday evenings last. They were interesting, the latter especially so. Of this, considering the important nature of the subject, Agricultural Chemistry, we will endeavor to give a synopsis.

The Professor began by recapitulating his lecture of the previous evening. He had there stated that constant cropping, where the products were removed from the soil and no returns made would result in inevitable impoverishment and final exhaustion. This is clearly seen not only from experience, but from a consideration of the nature and composition of soils. Soils are composed of a variety of elements, some in large, some in small proportions. The former, such as silex or sand, and alumina or clay, are comparatively valueless, their principal purpose being to give texture, consistency and substance to the soil. Sand but seldom and clay never enters into the composition of either plants or animals. But on the other hand, those elements which are found in small quantities, such as the phosphates, soda, magnesia, potash, lime, &c., are *absolutely essential* to the plants upon which men and other animals subsist. The seed, and leaf, bone and nerves, blood and brain, all contain these elements. Every crop that grows takes up a portion of one or more of these *essential* elements; since they exist in small quantities they must of course be sooner or later entirely consumed, and when this takes place, the plant, since they *are* essential to its composition, necessarily refuses to grow. The system of cropping and *resting* merely postpones this inevitable result. By resting the soil nothing is added thereto. The only effect is that by the action of atmosphere and other causes, its elements are brought into a condition in which they can be more readily absorbed. If, for instance, silex should be combined with any of the essentials, it would be disunited by the action of the atmosphere, and the essential would be ready to be taken up by the roots of the plant. This process then, instead of preventing the exhaustion, only secures its more complete development in the end. Then comes the question, the subject of the present lecture, How are soils to be regenerated and preserved?

The system of green crops, as for instance, clover, buckwheat and peas, does not effect this. The roots of these plants, especially the first mentioned, strike deep into the earth, and thereby bring certain elements up to the surface and within reach of the roots of plants such as wheat &c., which only penetrate the surface. But they do not add any of the expensive elements, as potash, &c. Gypsum, (plaster of Paris,) is sometimes sowed with clover. This is good as far as it goes, since it adds sulphuric acid and lime, the latter of which is an "expensive" element, while the former furnishes sulphur to certain constituents of plants, such as gluten. The farmers of Western New York use this method in the cultivation of wheat, and maintain that nothing further is necessary, but by means of it the soil will always remain fertile. Fortunately for them their soil is exceedingly rich, and as yet they do not, perhaps for a long time will not discover any injurious effects. But in England, where the same system is pursued, the land has become in some places, what the farmers call "clover sick." But it is really sick from exhaustion, since phosphoric acid and soda have been constantly taken away without any return.

Buckwheat, which as above stated, has been used like clover as a fertilizer, farmers formerly thought would grow well anywhere upon any kind of soil. This proved to be a mistake, since it contained a large proportion of the "expensive" elements, and for this reason it is well used, since the roots, by striking deep, bring up for the use of other plants elements which their roots would not otherwise have reached.

Clover might be successfully introduced into this country. Major Collier, had succeeded well in its cultivation by means of the marl found in large quantities upon his estate. Oats might be used with clover in order to protect it from the wind and cold.

Lands could be regenerated and preserved in a state of fertility, by the system of manuring. With the effects of litter and barnyard manure, all were well acquainted. It would be unnecessary to speak of them. The excrements of fowls add both the expensive and nitrogenous elements to the soil. This substance, mixed with six times its weight of gypsum, constitutes one of the best manures. He had known it used by a farmer upon fifteen acres, with very great success It however must not touch the grain. It may be deposited in the hill beneath the grain, with a thin layer of earth intervening.

The fluid and solid excrements of men, particularly the former, also constitute a most excellent fertilizer. The fluid should by all means be preserved, especially upon large plantations where the slaves are numerous.—A hogshead or reservoir of some kind should be kept for its reception. It could be carried in a tank upon a low cart over the fields, and spread over them broad-cast, just as water is spread over the streets of cities. Or the hogshead might be carried upon the cart, and might be perforated with numerous holes closed by pegs, until the field designed to be enriched was reached, when they could be drawn out. This system has been pursued with great success.

There is an inexhaustible supply of muck, or peat, which is muck in an advanced stage of decomposition, in the swamps and marshes of this region. But it requires some preparation in order to become a fertilizer. It should be taken while fresh and moist and mixed with a little lime. It should be kept wet, and then by being exposed to the alternations of heat and cold, by freezing and thawing, it will eventually crumble, be reduced to a powder, and become fit for use.

Saltpetre is not a good fertilizer for plants used as food. It does well where the stem or leaf is sought to be increased, as in the case of hay and fodder, but will not assist the grain or seed.

Common salt is not so good a fertilizer as is generally supposed. Wheat and other cereal plants do not require chlorine or sodium, the elements of which salt is composed, but rather potash.

There is a variety of marls in this region of country, and along the Cape Fear, and this substance may be found to a greater or less extent, from Long Island to Alabama.—The most recent formation, or that which is found first upon digging, is the shell or *stone* marl. The only difference between these two is, that in the former, the shells are in a state of preservation, in the latter, they have been decomposed and consolidated into stone. The latter is the better, since having been decomposed, it is the more ready to enter into the composition of plants. It has the appearance of a reddish clay, is apt to be considered such by the farmer, and so to be neglected by him. But that it is marl, may be easily shown by pouring sulphuric acid, common vinegar, or any of the acids upon it. It will be found to effervesce. (The Professor here produced a piece of this marl and made the experiment.) Underneath this shell and stone marl, lies a marly clay, and beneath this the "green sand" marl. This last substance does not effervesce upon the application of sulphuric acid because it contains no lime. Notwithstanding its name, it is rather blue than green, and somewhat resembles a bluish clay. This substance is generally used in New Jersey. In that State many plantations had been reduced to a state of almost perfect barrenness, and many farmers were about to leave. Luckily this "green sand" marl was discovered, and applied, and the once sterile fields now support a luxuriant and profitable vegetation. Marl requires preparation before it is used. It should be mingled with organic matter such as leaves or barn-yard manure, in alternate layers, and the heap thus formed should occasionally, say every three or four weeks, be stirred up with a shovel or spade.

Bones are probably the best of all fertilizers. They pay for them in England 5 or 6 pounds sterling per ton, and for *fossil* bones, which are less valuable, two pounds ten shillings. England has made a double use of her soldiers who fell at Waterloo. She used them first to fight her battles, afterwards their bones to fertilize her soil. The site of that bside has never since been brought into cultivation, but is covered with wild, rank and luxuriant vegetation. Bones must be ground for use, the finer, the better the immediate results. They may be scattered broad cast over the soil, but the more usual way is to dissolve them in oil of vitriol or water, and then mix them with marl or ashes. Bone beds are sometimes found in marl beds, and of course add greatly to their value. The principal use of bones is to give phosphoric acid to the soil.

Guano consists of the excrements of birds, and used as a manure with us, is sometimes attended with good effects. There are two kinds, the African and the Peruvian. The latter is valuable on account of the ammonia which it contains, the former on account of its phosphate of lime, and is the more valuable of the two. Their results depend upon the season. If that is dry, they are of no apparent use. It is not a manure with which we would probably be satisfied.

The Professor then touched upon the subject of special manuring. If, said he, we know what element any plant particularly requires, and wish to cultivate that plant, of course we would seek to supply that element. Turnips require lime chiefly. In cultivating turnips then, we would add lime to the soil. So we would add potash or something containing it for tobacco, &c. Tobacco requires a very large amount of potash, and unless it can obtain it, or if any other substance, as soda, supplies the place of potash, the tobacco is not good. In some plants, the name of which at present escapes us, tobacco is inspected by means of chemical analysis, and is pronounced bad if not found to contain a large quantity of potash.

The Professor concluded by urging upon the citizens the necessity of organization.—Farming was a subject which called into exercise a great deal of learning, more than either law or divinity, and associations were therefore necessary for its more speedy and successful diffusion. A vast number of experiments were to be made upon the adaptation of manures to the soil, and of the soil to crops. These could not be made by a single individual. There must be a division of labor. Experiments of different kinds must be made by different individuals, and the results made known to each other by means of organized associations. While our internal improvements are going on admirably and tending towards perfection, a system of home improvements, the improvement of husbandry, of cattle and of the soil, should go hand in hand therewith. Inasmuch as a way to market is opened, encouragement is furnished to raise a surplus, by which only the farmer's pocket is filled. This to be sure is an argumentum ad hominem, or rather an argument to the pocket, but it should be full of persuasion. As it is desirable to have a foreign market, so it is more desirable to have one at home, and for this reason the clash of the steam mill and the buzz of machinery, should be heard in our village.

At the close of the lecture, our friend, Dr. Andrews, asked Professor Emmons why it was, that clover would spring up where gypsum was sown, although no clover had ever been near the place. The Professor replied, that the seed must exist previously in the soil and that they could perhaps be discovered upon a microscopic examination. Seed always require three things to enable them to shoot, viz: light, air and water, and wanting these they will lie for a long time dormant. Grass often springs from the dirt brought up from beneath the surface of the earth, as from the bottom of a well. Seed must have been in the dirt. Some suppose that seeds of every variety are sown broadcast over the earth, and only wait for a favorable opportunity to develop themselves. The Professor alluded also to the fact, that new varieties of wheat had been reared from seed found in the Catacombs of Egypt, and which had probably been lying there dormant for centuries.

Golds. Tel.

☞ Professor Emmons has discovered the fossil remains, principally teeth, of twelve different varieties of the shark, along the banks of the Cape Fear and the Neuse. He showed us the tooth of one of these animals, found in Bladen, near Elizabeth, which he says must have belonged to a creature measuring in length at least one hundred feet.—The teeth of the shark are exceedingly keen, and are intended rather to lacerate and kill than to masticate the victim upon which it preys.—It swallows its food whole. It is rather a singular fact, that this animal is provided with several rows of teeth. The teeth of one of these rows is erect, the other inclined inwardly. The former are used in seizing the prey and the bristling surface presented by the latter prevents its escape If one of the former is broken out or in any way lost, one of the latter situated below and coming to work upon a kind of hinge or spring, rises up to supply its place.—*Tel.*

MELANCHOLY OCCURRENCE.

A valuable female servant, about 18 years of age, the property of E. D. M'Nair, Esq. of this vicinity, was so severely burnt on Sunday morning last, by her dress catching on fire, that she died early on Monday. She was employed in bathing with camphire an aged servant suffering under an attack of rheumatism. Her back being towards the fire, her clothes caught, and the flames had made considerable progress before she discovered her danger. Wild with affright, she fled from the kitchen to the house, by which time she was perfectly enveloped in flames. Mr. M'Nair had been induced to return from church before the completion of the service, in consequence of the morning indisposition of his little son, and did what he could to extinguish the fire, but the servant was so severely burnt that the physician at once pronounced her recovery hopeless.—She lingered through the night, seemingly insensible to pain, and died at about 7 o'clock on Monday morning.

Though it failed to save the life of the servant, it seemed a providential interference that induced Mr. M'Nair to return home. In the room to which the servant removed was a bed with curtains, and other light inflammable materials, which she passed near, and would greatly have endangered the house if none of the white family had been present.

Hills. Rec.

MR. FILLMORE.

For a time some fears were entertained by the friends of Mr. Fillmore in the South, that he would not consent for his name to go before the Whig National Convention. A recent article which we copied from the Republic, however, gave us some assurance that he would yeild to the earnest solicitions of his friends, and we are happy to state that we have since received information, from a source entitled to the utmost confidence, which puts the matter beyond doubt. Mr. Fillmore's name will go before the Convention; and if the wishes of the South are consulted, we believe he will stand almost without a rival in that body.—*Hills. Rec.*