



AND NORTH-CAROLINA GAZETTE.

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The importance of Science to Agriculture.

From Davies Introductory Lecture on Agricultural Chemistry.

If land be unproductive, and a system of amelioration is to be attempted, the sure method of obtaining the object is by determining the cause of its sterility, which must necessarily depend upon some defect in the constitution of the soil, which may be easily discovered by the chemical analysis.

Some lands of good apparent texture, are yet sterile in a high degree; and common observation and common practice afford no means of ascertaining the cause, or removing the effect. The application of chemical texts in such cases is obvious; for the soil must contain some noxious principle which may be easily discovered, and probably easily destroyed.

Are any of the salts of iron present? they may be decomposed by lime. Is there an excess of siliceous sand? the system of improvement must depend on the application of clay and calcareous matter? the remedy is obvious. Is an excess of vegetable matter indicated? it may be removed by liming, paring and burning. Is there a deficiency of vegetable matter? it is to be supplied by manure.

There has been no question on which more difference of opinion has existed, than that of the state in which manure ought to be ploughed into the land; whether recent, or when it has gone through the process of fermentation? and this subject is still a subject of discussion; but whoever will refer to the simplest principle of chemistry, cannot entertain a doubt on the subject. As soon as the dung begins to decompose, it throws off its volatile parts, which are the most valuable and most efficient. Dung which has fermented, so as to become a mere soft cohesive mass, has generally lost from one third to one half of its most useful constituent elements. It evidently should be applied as soon as fermentation begins, that it may exert its full action upon the plant, and lose none of its nutritive powers.

It would be easy to adduce a multitude of other instances of the same kind; but sufficient I trust has been said to prove that, the connection of chemistry with agriculture is not founded on a mere vague speculation, but that it offers principles which ought to be understood and followed, and which in their progression and ultimate results, can hardly fail to be highly beneficial to the community.

The phenomena of vegetation must be considered as an important branch of the science of organized nature; but though exalted above inorganic matter, vegetables are yet in a great measure dependent for their existence upon its laws. They receive their nourishment from the internal element; they assimilate it by means of peculiar organs; and it is by examining their physical and chemical constitution, and the substances and powers which act upon them, and the modifications which they undergo, that the scientific principles of agricultural chemistry are obtained.

According to these ideas, it is evident that the study ought to be commenced by some general enquiries into the composition and nature of material bodies, and the law of their changes. The surface of the earth, the atmosphere, and the water deposited from it, must either together or separately, afford all the principles concerned in vegetation; and it is only by examining the chemical nature of these principles, that we are capable of discovering what is the food which is supplied & prepared for their nourishment.

In all plants there exists a system of tubes or vessels, which in one extremity terminate in the roots, and in the other in leaves. It is by the capillary action of the roots that fluid matter is taken up from the soil. The sap in passing upwards becomes denser, and more fit to deposit solid matter; it is modified by exposure to heat, light, and air in the leaves; descends through the bark; in its progress produces new organized matter, and is thus, in its vernal and autumnal flow, the cause of the formation of new parts, and of the more perfect evolution of parts already formed.

If the organs of plants be submitted to chemical analysis, it is found that their almost infinite diversity of form, depends upon different arrange-

ments and combinations of a very few of the elements; seldom more than seven or eight belong to them, & three constitute the greatest part of their organized matter; and according to the manner in which these elements are disposed, arise the different properties of the products of vegetation, whether employed as food, or for other purposes and wants of life.

The value & uses of every species of agricultural produce, are most correctly estimated and applied when practical knowledge is assisted by principles derived from chemistry. The compounds in vegetables really nutritive as the food of animals, are very few, farina, or the pure matter of starch, gluten, vegetable jelly, and extract. Of these the most nutritive is gluten, which approaches nearest in its nature to animal matter, & which is the substance that gives to wheat its superiority over other grain. The next in order as to nourishing power is sugar, then farina; and last of all gelatinous and extractive matter. Simple tests of the relative nourishing powers of the different species of food, are the relative quantities of these substances that they afford by analysis; and though taste and appearance must influence the consumption of all articles in years of plenty, yet they are less attended to in times of scarcity, and on such occasions this kind of knowledge may be of the greatest importance. Sugar and farina, or starch, are very similar in composition, and are capable of being converted into each other by simple chemical processes.

All the varieties of substances found in plants, are produced from the sap, and the sap of plants is derived from water, or from the fluids in the soil, and it is altered by or combined with the principles derived from the atmosphere.

Soils in all cases consist of a mixture of different finely divided earthy matters; with animal or vegetable substances in a state of decomposition, and certain saline ingredients. The earthy matters are the true basis of the soil: the other parts, whether natural, or artificially introduced, operate in the same manner as manures. Four earths generally abound in soils, the aluminous, the siliceous, the calcareous, and the magnesian. These earths, as I have discovered, consist of highly inflammable metals united to pure air or oxygen; and they are not, as far as we know, decomposed or altered in vegetation.

The great use of the soil is to afford support to the plant, to enable it to fix its roots, and to derive nourishment by its tubes slowly and gradually, from the soluble and dissolved substance mixed with the earths.

That a particular mixture of the earth is connected with fertility, cannot be doubted; and almost all sterile soils are capable of being improved, by modification of their earthy constituent parts. I shall describe the simple method as yet discovered of analysing soils, and of ascertaining the constitution and chemical ingredients which appear to be connected with fertility, and on this subject many of the former difficulties of investigation will be found to be removed by recent inquiries.

Animals produce a substance which appears to be a necessary food of vegetables; vegetables evolve a principle necessary to the existence of animals; these different classes of beings seem to be thus connected together in the exercise of their living functions, and to a certain extent may depend upon each other for their existence. Water raised from the ocean, diffused through the air, and poured down upon the soil, so as to be applied to the purposes of life. The different parts of the atmosphere are mingled together by winds or changes of temperature, and successively brought in contact with the surface of the earth, so as to exert their fertilizing influence. The modifications of the soil, and the application of manures are placed within the power of man, as if for the purpose of awakening his industry, and calling forth his powers.

Plants are found by analysis to consist principally of charcoal and aeriform matter.

These elements they gain either by their leaves from the air or by their roots from the soil. All manures from organized substances contain the prin-

ciples of vegetable matter, which during putrefaction are rendered either soluble in water or aeriform; and in these states they are capable of being assimilated to the vegetable organs. No one principle affords the pabulum of vegetable life; it is neither charcoal nor hydrogen, nor azote, nor oxygen alone; but all of them together in various states and various combinations. Organic substances, as soon as they are deprived of vitality, begin to pass through a series of changes which end in their complete destruction, in the entire separation and dissipation of the parts. Animal matters are the soonest destroyed by the operation of the air, heat and light. Vegetable substances yield more slowly, but finally obey the same laws. The periods of the application of manures from decomposing animal and vegetable substances, depend upon the knowledge of these principles, and I shall be able to produce some new & important facts founded upon them, which I trust will remove all doubt from this part of agricultural theory.

The chemistry of the more simple manures; the manures which act in very small quantities, such as gypsum, alkafies, and various saline substances, has hitherto been exceedingly obscure. It has been generally supposed that these materials act in the vegetable economy in the same manner as conditions or stimulants in the animal economy, and that they render the common food more nutritive. It seems, however, a much more probable idea, that they are actually a part of the true food of plants, and that they supply that kind of matter to the vegetable fibre, which is analagous to the bony matter in animal structures.

The operation of gypsum, it is well known, is extremely capricious in this country, and no certain data have hitherto been offered for its application.

There is however, good ground for supposing that the subject will be fully elucidated by chemical enquiry. Those plants which seem most benefited by its application, are plants which always afford it an analysis. Clover, and most of the artificial grasses, contain it, but it exists in very minute quantity only in barley, wheat, and turneps.

Chalks, calcareous marles, or powdered limestone, act merely by forming an useful earthy ingredient of the soil, and the efficacy is proportioned to the deficiency of calcareous matter which in larger or smaller quantities seem to be an essential ingredient of all fertile soils; necessary perhaps to their proper texture, and as an ingredient in the organs of plants.

Burnt lime in its first effect, acts as a decomposing agent upon animal or vegetable matter, and seems to bring it into a state on which it becomes more rapidly a vegetable nourishment, gradually, however, the lime is neutralized by carbonic acid, and converted into a substance analagous to chalk; but in this case it more perfectly mixes with the other ingredients of the soil, is more generally diffused and finely divided; and it is probably more useful to land than any calcareous substance in its natural state.

TWENTY DOLLARS REWARD.

RAN AWAY from the Subscriber, in York District, South Carolina, on the 10th April last, a Negro man named CALER, about forty years of age, five feet, five or six inches high, yellow complexion, and tolerable stout make; he had on when he went away a blue cotton coat and white cotton pantaloons. He was brought from Virginia about two years past, and he expects he will endeavor to get back to Richmond. The above reward will be given to any person who will apprehend said negro and lodge him in jail so that I get him.

JOHN S. BRETTON 80 6w

FOR SALE,

622 acres of valuable Land on Deep River, in Chatham County, adjoining Gulf Mills, whereon the Subscriber now lives.

On the Premises there is a commodious Dwelling House almost new, a good Store-house, Wa house, and necessary out-houses. It is well known to be one of the best stands in the Back Country for a Store; there is a Coal Mine on the Lands, and within 4 or 500 yards of the River, which has been tried and found of a good quality. Further particulars are deemed unnecessary, as it is presumed that those who are inclined to purchase, will view the lands.

Also about 92 acres of Wood land near the Town of Hywood, covered with excellent timber—A liberal credit will be given. JOHN TYSON, Jr. 81 4w

Dr. James M. & William Henderson, HAVING entered into a Medical Co-partnership, will attend to all calls connected with their Profession. They will occupy the Stand of Dr. Wm. Henderson, at the corner of Fayetteville & Martin Streets April 15. 69 1f

CAPE-FEAR NAVIGATION.

PURSUANT to a Resolution of the President and Directors, the Stockholders of this Company are notified, that a fourth instalment of the capital stock, is required to be paid to the Treasurer in Fayetteville, on Monday the 3d day of August next.

J. W. WRIGHT, Treas. 78 A3

VALUABLE LANDS.

FOR SALE—seven hundred acres of Swamp Land, lying on Peedee River, near Marion Courthouse, South-Carolina. The above land is of the prime quality, about 50 miles above Georgetown, S. C. to which there is the best Navigation, and in the midst of the finest range for cattle and hogs in the country. A neighbor to the above lands owns from 80 to 100 milch Cows, which are wintered by the natural range. The above Land will be sold for \$2500, to close a concern. Apply to THOMAS EVANS, Marion Courthouse, S. C. July 15 3w

VALUABLE LANDS FOR SALE.

AGREEABLE to the last Will and Testament of Wm A Eaton, will be sold on the premises, to the highest bidder, the 15th of September next, 1st fair, if not the following day—Eleven Hundred Acres of Land lying in Northampton County, immediately on the river, five miles above the Rock Landing, about half of which is low ground. The land includes one of the most valuable Ferries on the river, and is well adapted to the production of Tobacco, Wheat, Corn or Cotton; and there is enough cleared & in good repair to work 15 to 20 hands to an advantage. The terms of the sale will be seven thousand dollars, to be paid when the conveyance is made, the balance in five annual payments, the three last to bear interest from the 15th of September 1820, good security will be required. The lands may be seen by application to Mr. Thos. B Ryland who lives on the premises, or Mr. Benjamin A. Eaton. The purchaser may have the privilege of sowing wheat, and possession given the 25th of December next.

Will be sold at the same time and place, some valuable work Horses, Cattle, Sows & Pigs; and a Cotton Machine, on a credit of twelve months.

By the Executors, H. G. Williams, Samuel Williams, Benjamin A. Eaton. 84 tds

FROM 200 to 400 LOTS,

IN THE TOWN OF MARATTOCK,

Will be sold to the highest bidder, on a credit of six months, on the 1st day of SEPTEMBER next.

LOTS of the Ground will be exhibited on that day; but can be seen before, on application to the Subscriber. This town is situated in Halifax county, N. C. immediately at the foot of the lowest falls on Roanoke River; and on its south bank, it spreads over a plain well calculated for the object, and one that delights the eye with the beauties of nature, while it exhilarates the soul with the prospect of plenty. It is well watered, and has proven as healthful as any neighboring situation on the river; it has also good banks for a landing, and a very public ferry immediately at it, which gives it easy access from the opposite side. A Canal is now cutting on the same side, round the falls, which is intended to open a communication between the small and large craft. Navigation boats, carrying from forty to sixty hogsheds of Tobacco, are constantly employed in freighting Tobacco, Flour, &c. &c. which come down the river, from the falls to Norfolk, a distance of about two hundred and forty miles by water. The Roanoke, when she resumes her long lost, but unquestionable right, will, in a commercial point of view, rank with any of her sister Atlantic streams, south of the Potomac, and east of the Mississippi. The extensive and fertile back country, which borders on Roanoke, and its many branches, most of which can be made navigable, will give importance to some place on her banks, that will have no cause to repine at the prosperity of Richmond. The rapid progress making in the navigation, & the vast quantity of produce which has been brought down; some of which descended the river from 200 miles above the falls, notwithstanding its unimproved state, give evidence of its future importance, too plain to be mistaken. In the course of eighteen months, fifty or more Batteaux, such as are in James River above Richmond, have commenced running and have brought down to the head of the falls, which is about eight miles above the foot, 2000 or more hogsheds of Tobacco, besides a vast quantity of other produce, notwithstanding the difficulties of a land carriage around the falls, which will be obviated when the Canal is completed. I hope gentlemen will view the premises, & take into consideration the many advantages which shew to ocular demonstration, regardless of the many opinions which may be expressed on that subject.

HENRY SMITH. 84 tds

June 11th, 1818.

A PETITION.

I SHALL present a Petition to the next General Assembly of North-Carolina, the purport of which will be, to get a law passed which may empower Commissioners appointed for the purpose (or myself) to lay out a part of the lands at the foot of the Great Falls of Roanoke in the county of Halifax, N. C. belonging to the orphans of Daniel Weldon, into Lots, and to sell them in the manner which may be prescribed.

SAM'L LUNT, Guardian. 75 As

July 20

By the President of the United States,

WHEREAS, by an act of Congress, passed on the 17th of February, 1818, entitled "an act making provision for the establishment of additional Land Offices in the territory of Missouri," the President of the United States is authorized to direct the public lands, which have been surveyed in the said territory to be offered for sale:

Therefore, I, James Monroe, President of the United States, do hereby declare & make known, that public sales for the disposal (agreeably to law) of certain lands in the territory of Missouri, shall be held in Franklin, in said territory, viz:

On the first Monday in January next for the sale of Townships No. 46 to 52 inclusive and fractional townships in range 19 ship 53 49 to 52 and 20 fractional township 53 48 to 52 21, 22 & 23

On the first Monday in March next, for the sale of Townships 48 to 55 inclusive, in ranges 24 & 25 48 to 50 26 & 27

On the first Monday in May next, for the sale of Townships 51 to 54 inclusive, in ranges 11 & 12 51 to 56 13 & 15

excepting the lands which have been, or may be reserved by law, for the support of schools, and for other purposes.

Each sale shall continue as long as may be necessary to offer the lands for sale, and no longer, and the lands shall be offered in regular numerical order.

Given under my hand, at the city of Washington, this 17th day of July, one thousand eight hundred and eighteen.

JAMES MONROE, E.

By the President: JOSIAH WELLS, Commissioner of the General Land Office.

ABSCONDED

FROM the service of the Subscriber, in February, 1816, I met a Reach, his apprentice to the Farming Business. The said Runaway was advertised in this Paper within a few weeks of the above time; but though he has since appeared in the Neigh. School, he has not returned to the service of the subscriber.

Said Timothy is 19 years of age, about 5 feet 9 or 10 inches high, tolerably well made, light hair and eyes.

This is therefore again to warn the Public against harboring or employing the said Runaway on pain of prosecution.

Any person who shall apprehend and restore the said apprentice to the advertiser shall receive Ten Dollars Reward.

82 3w ZACHARIAH R. ACH.

GATES COUNTY.

In Equity, April Term, 1818.

James Hoffman, Petitioner filed.

Deborah Hoffman, THE Defendant being out of the State, or so concerned here in, that the ordinary process of law cannot be served upon her; it is therefore, ordered by the Court, that publication be made in the Raleigh Register, for six weeks successively, giving notice to the said defendants, that unless they appear at the next Court to be held for the said County of Hertford, at the Courthouse in Winton, on the 4th Monday in August next, and plead, answer or demur, the petitioner's petition will be taken pro confesso, and the matter therefore decreed accordingly.

Test. M RIDDICK, C & M. E. 3-74

May 14 818

STATE OF NORTH-CAROLINA,

HERTFORD COUNTY, May Term, 1818.

Howell Jones, Adm'r. Pet to seize real Estate.

The heirs at law of James Usher, dec'd.

IT being suggested to the Court that the defendants, whose names are unknown, are not residents of this State—it is ordered, that publication be made in the Raleigh Register, for six weeks successively, giving notice to the said defendants, that unless they appear at the next Court to be held for the said County of Hertford, at the Courthouse in Winton, on the 4th Monday in August next, and plead, answer or demur, the petitioner's petition will be taken pro confesso, and the matter therefore decreed accordingly. Copy Test. JOS. F. DICKINSON, c. c. c.

STATE OF NORTH-CAROLINA,

Mecklenburg County, Superior Court of Law, May Term, 1818.

Elizabeth Smith, Petitioner for Divorce

William Smith and Almoy.

IT appearing to the Court, that the Defendant, William Smith, is not a citizen of this State, it is therefore ordered, that publication be made for three months in the Star, and Raleigh Register newspapers printed in the City of Raleigh, that unless the said William Smith appear at the next term of said Court to be held on the 6th Monday after the 4th Monday in September next, and plead, answer, or demur to the plaintiff's petition, it will be heard ex-parte, an judgment pro confesso entered against him. GEORGE GRAHAM, c. s. c. d.