

FERTILIZATION, OUR GREATEST PROBLEM

Paper Read Before Engineering Society of the Carolinas, Charlotte, N. C., by W. S. Lee.

"We stand near some trunk line railroad and see whirling by its train load after trainload of some product of our soil, such as watermelons, cantaloupes or various fruits and vegetables. We are very much impressed with the magnitude of this particular line of agriculture. When we consider that the products of our soil are being shipped in enormous quantities to various quarters of the globe, then reflect but a moment, we can readily see that we must have some very fertile or productive soil which we are depleting, or which must be replenished by suitable fertilization.

"If we could tabulate the tonnage of our farm products which are going out of our territory each year, I fear we would be alarmed as to what the conditions will bring forth. We are told by our physicist that according to the law of conservation of matter, not a particle can be annihilated, then reflect but a moment, we feel that while we are taking enormous products from the soil, this matter will eventually find its way back. This may be theoretical, but it will require a long time for the fruits and vegetables which we are shipping to the large centers, such as New York city, and are there used or wasted, to ever find their way back to fertilize the soil of the Carolinas.

"For many years ship load after ship load of cotton has been moving from the south to be spun in England. Can anyone tell you when the matter which is so moved will ever be returned to replenish the soil on which we have been drawing? Our agricultural processes have been so used and only partially tilled, that from year to year we have been laying aside the land which has been robbed of its fertility, only to clear away our forests and use more fertile soil. The rate at which this has been going on, is showing very plainly to the thinking man that this must be stopped and we must arrange to prepare to fertilize this old soil to keep up our enormous production.

"The failure of the soil to reproduce as it formerly did, has given rise to an enormous business in the manufacture of commercial fertilizers.

"Before considering our method of fertilizing we wish to discuss one important element which seems to pervade so many of the compounds which we find useful in every day life. This element, nitrogen, which we find in combination with others, is very active.

"We find it in our perfumes, also in some of our most obnoxious smells. We find it in our beautiful dyes, also in a great many of our medicines used in our sick room; in the deadly poison, such as prussic acid, and in the ptomaines this element also lurks. It drives our bullets in the form of gunpowder, it forms our powerful explosives, dynamite, it dissolves our metals in the form of nitric acid, and extracts our gold extracts in the form of cyanide.

"About three-fourths of our atmosphere is composed of nitrogen. While it is very active in other compounds, it is very inert and inactive in our atmosphere. We find that compounds of nitrogen furnish our chief source of fertilizers. There are three sources from which this fertilizer is derived.

"First—Peruvian Guano—This is an accumulation and remains of sea birds, which is shipped us from Peru. In 1856 about 50,000 tons per year was derived from this source; today there is practically none, as this has been almost exhausted.

"Second—Source of nitrogen is derived from ammonium sulphate, this being a by-product in the distillation of coal tar. In 1900 this amounted to about 500,000 tons per year, valued at about \$2,000,000.00.

"Third—Source of nitrate of soda, or nitrites called Chili salt petre. This comes from a narrow strip of land between the Andes and coast hills which is a rainless district, and there from countless ages the fixation of nitrates has been going on account of atmospheric and soil conditions. In 1860 about 68,000 tons were derived from this source. In 1900, 1,453,000 tons was used. It is estimated that within from 15 to 20 years, that that source will be totally exhausted. About one-fourth of this is used in the various industries, and about three-fourths is used for the fertilization of the soil in the agricultural districts of Europe and America.

"The formation of these valuable deposits required ages and ages, but man in his hurry today is not patient enough to wait for such formations. In a mad endeavor to secure more from the soil that nature intended, he is continually looking for some artificial means to increase its production.

"Nature has made heroic efforts to provide for man, as well as take care of the waste of her bounties. She no doubt must look down on man and feel that he is using his energies to turn her plans topsy-turvy or put the world awry.

"There is one other indirect source in which our farmers are endeavoring to replenish or to fertilize their soils. That is by planting certain plants, such as clover, beans and peas. Near the base of the stalks are little nodules which are veritable colonies of nitrifying microbes. Our farmers well know that a crop of peas will produce a great effect in fertilizing their land, and they often plant for this purpose.

"How many times have we stood and watched the beauty of a thunder storm, and wondered what good the charges and oft-times destructive forces of lightning could do. We are told that as this lightning flashes through the atmosphere it burns and fixes certain nitrates from the air. These in turn are washed down by the rain into the soil, producing a fertilizer. This has presented a new scheme to some of our scientists, and as we have made many attempts to harness the lightning in the way of our tremendous electrical developments, it immediately occurs to the scientist that he should be able to make these nitrates from the air. The scientist further has weighed the conditions, and has noted our enormous

products moving from our productive soil to other places, and the fast disappearance of our fertilizer nitra beds. He has come to the conclusion that unless there is some provision made for fertilizing, that we will surely find ourselves without bread and in the midst of a famine and a country that is almost a desert.

"While this is the ordinary layman a very startling assertion, it is none the less an absolute fact, that unless some provision is made must occur.

"As stated above the harnessing of our immense water powers and our utilization of the production of lightning has given us an opportunity to make these nitrates which, if carried on successfully, will remedy these starting conditions.

"About 10 years ago the Atmospheric Company was formed at Niagara Falls, and from all their experiments succeeded successfully in making nitrate acids and some compounds of nitrogen.

"We are told today that in Norway and Sweden enormous plants are now successfully working, which are producing fertilizers and nitrogen compounds. The matter that comes nearer home to us is the manufacture of nitrates in our own immediate territory. From all indications it will be but a short time in which the entire output of our water powers will be consuming their energy in burning nitrogen and producing fertilizer for our farms right at home.

"Each year our electrical improvements are enabling us to accomplish greater results. High voltages and excessive currents of a few years ago are very commonplace today. There has been recently perfected apparatus that is not costly but well adapted for the manufacture of nitrates from the air.

"We expect to see at no distant day the farmer who is situated near an electrical development or near their transmission lines, with his own plant producing his fertilizer, and doing it at a season of the year when the power company has plenty of surplus power that could be sold cheap. This production of fertilizer will obviate, to a large extent, the work of hauling from railroad stations to remote farms in the country."

DES MOINES PLAN IN PRACTISE

Des Moines, Ia., March 30.—The men who will govern Des Moines during the next two years, under the so-called commission form of government, are being voted for at today's election.

Des Moines is acknowledged as the originator of the commission form of government, as applied to American cities, and the results of her experience will be followed with close attention throughout the country.

That the people themselves are alive to the importance of the occasion was evidenced by the early vote this morning, which was said to be larger than ever before at an election in this city.

The election today registers the final choice of the people in regard to the candidates selected at the primary two weeks ago. At the primary two candidates were selected for mayor and eight candidates were selected for commissioners from a list of forty-two that were voted for. The election today will result in the final choice of a mayor and four commissioners.

The chief aim of the Des Moines plan is the elimination of politics from the municipal government. So far the working out of the plan has been satisfactory. The recent primary was decidedly a people's election. Among the defeated candidates for commissioner were many old politicians who have held office in Des Moines for years. The highest vote given any one candidate for commissioner was for John Macvicar, a former mayor of the city and one of the founders of the American Municipal Reform Society. Old-time politicians, including several former councilmen and other officeholders, were snuffed under at the primary.

The two majority candidates being voted for today are A. J. Mathis, the present police judge, and Eugene Waterbury, who is regarded as a slate candidate. Mathis is a democrat and Waterbury a republican.

If the advocates of the plan hold to the rule of no politics and do not draw party lines Mathis is believed to have the best chance of winning.

Of the eight candidates for commissioner four are independent, one represents the labor element and the other three are looked upon as candidates of the "ring."

Politicians predict defeat for the slate members on the ground that, inasmuch as there was a concentrated fight in the primary in behalf of the slate members, the scattering vote will go to the independent candidates in the final election today.

BAD BLOOD

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W. T. MCCOY

Meets At New Orleans

New Orleans, La., March 30.—Men and women experts in the work of training the young and starting baby minds on the long road of learning gathered in force in this city today for the opening of the 15th annual convention of the International Kindergarten Union.

The delegates and visitors number several thousand and come from all parts of the United States and Canada, with a number from other countries.

A preliminary session was held at the St. Charles Hotel this morning to complete the final details of the convention program.

Miss Lucy Wacecock, of Boston, presided.

This afternoon a conference of supervisors and training teachers was held at Tulane University.

Plans to increase the efficiency of the kindergarten training schools formed the chief topic of discussion.

Miss Elizabeth Harrison, principal of Chicago Kindergarten College, occupied the chair and among the prominent participants in the discussions were Miss Clara Wheeler, of Grand Rapids; Mrs. Mary B. Page, of Chicago; Miss Mary D. Hill, of Louisville; Miss Willette Allen, of Atlanta; Mrs. Anna Noble, of San Antonio; Miss Nina Vandunwaiker, of Milwaukee, and Miss Marion Hauckel of Charleston, S. C.

The first public session, with addresses of welcome and responses, will be held tomorrow morning.

AMUSEMENTS

Murray & Mack.
Tomorrow night at the Academy of Music, the clever comedians, Murray & Mack, will be seen in their newest and most successful musical comedy, "The Sunny Side of Broadway." Murray & Mack have been coming to Charlotte for years and on each visit they have presented different plays. This season they are appearing in the biggest success that they have ever enjoyed, "The Sunny Side of Broadway." The book of the piece is the work of Messrs. Walter and Murray, and the music is from the pen of Boyle Woolfolk, one of this country's best composers. Murray & Mack have this season surrounded themselves with an unusually large company of singers, comedians, and dancers, and should doubtless draw a big house when they appear here.

Seats are now selling at Hawley's.

Colonial Opera Company.
The Colonial Opera Company which is coming to the Academy of Music for a three nights engagement, beginning Thursday, is a well known musical organization and come here highly recommended. During their local engagement three different operas will be presented. On the opening night, "A Trip to India" will be given, on Friday night "Fra Diavolo" will be sung, and on Saturday night "Chimes of Normandy" will be offered. Seats are now selling at Hawley's.

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Solid Red Cedar Box, 36x15 inches.....\$6.50

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Funeral of Mr. P. W. Brown

Special to The News.
Salisbury, N. C., March 30.—The funeral of Mr. P. W. Brown, who died Saturday afternoon, will be conducted from the First Methodist church at 4 o'clock this afternoon by Rev. McLarty, of that church, and Rev. Clarke, of the First Methodist church. Mr. Brown was one of Salisbury's wealthiest citizens and owned considerable real estate. He was also a fourth owner in the Yadkin Valley Fair grounds. He was 48 years old, leaves a wife, several sons and daughters and a mother.

Conference of Unitarians.

Alameda, Cal., March 31.—Many delegates are here for the 23rd annual conference of the Pacific Coast Association of Unitarian Churches. The formal opening of the session takes place this evening and the proceedings will continue over Wednesday and Thursday. Church attendance, church finances, modern methods in Sunday school work, and the application of child study to instruction in the Sunday school are some of the chief topics scheduled for discussion. A number of prominent divines and church workers are among the participants.

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