Communications.

Osage Orange Hedge.

Editors Carolina Farmer:—Having visited your region in connection with matters pretaining to the improvement of the grounds of the Cape Fear Agricultural Association, I am familiar with the soil in your portion of the State, which although it is generally very sandy, I am confident that it can be made to grow the Osage orange well.

The plants should be grown one year on alluvial bottom land, and if planted at that age they have few lateral but generally have a straight tap root 12 to 20 inches in length. The hedge border should be prepared in your sandy soil by turning two furrows apart, plowing two furrows in depth, then haul the best soil obtainable, that containing a liberal proportion of clay and of vegetable mould will be the best. Give this open furrow a good dressing with this soil, then close the furrows in again. Run a harrow or some other levelling implement over the border, and sketch a line where the axis of the hedge is to be, using a line 100 feet or more in length.

It should be a strong line so that it will bear to be well stretched.

This line should have tied on it at intervals of one foot a wrapping of white wrapping twine: these are the markers at which a dibble is to be inserted with which to open holes to receive the plants. The dibble should be of hard smooth wood and should be neatly pointed; it should be 3x6 in length and should have a D—shaped handle on the top of it.

With this implement one active man will make holes for 5,000 plants *per diem* and two men and a boy can set the plants well.

The boy should stick the plants in the holes made by the dibble, and a man on each side of the row with a light, handy rammer should ram the soil firmly around them, using great care to keep the plants in line.

When planted thus use shovels with which to fill any cavities left in the use of the rammers. Having planted the hedge give it a good mulching with sea weed, wild grass or pine shatters.

The mulching should be heavy and should extend at least two feet on either side of the row of plants.

The tops of the plants should not be cut off, or shortened at planting, but the following Spring, after the buds are started, the plants should be cut to within two inches of the surface of the ground. I have now had 27 years experience with this plant for hedges, and have planted hundreds of miles of it, and would say that I consider it preferable to all others that I have tested, for making a straight, efficient fence. It is inexpensive to grow and maintain and where well kept is very beautiful.

I would recommend the Cape Fear Agricultural Association, to enclose its ground with an Osage Hedge, and if it is well planted and trained, those who do it will leave a pleasing and valuable legacy to those who may succeed them.

Respectfully yours,
J. Wilkinson,
Baltimore, Md.,
Landscape Gardener and Rural Architect.

A Visit to a Bone Mill.

Editors Carolina Farmer:—A few evenings ago I was passing near the bone mill of Mr. Geo. T. Ramby, of this city, and stepped in, or at least went to the door, to see what was going on. On the one side were the bones to be reduced, on the other the meal. The scent arising therefrom is scarcely to be endured. A stranger does as well to get as near as the door. The hands in the mill moving about in this horrible stench, say a person does not mind it after he gets used to it. The contrivance for reducing consists of some half dozen upright stems with cast iron at the bottom driven by steam, which are raised and dropped after the manner of crushing gold quartz. Capacity per day about one ton. Mr. R. however, purposes soon introducing some improved machinery which will greatly increase the capacity. Price per ton $48.

Many of the bones crushed are those of condemned army horses. One person a few miles over in Virginia furnished eighty tons for which he received $35 per ton, amounting to $2,800. These horses when killed were thrown into large pits and covered with dirt. After remaining from four to eight years the bones are exhumed, pulverized and rendered serviceable to the farmer. Several of such pits remain yet to be exhumed. One hand can dig up about two tons a day, which is doubtless, for the time being, more profitable than than the average gold digging in California but of course will soon give out.—The work is, of course, somewhat unpleasant, but then it should be recollected that "dirty hands handle bright money."

My object in giving the foregoing details is that your readers may form some idea of the great value of bones, and thus induce them to husband their resources and save all their bones. They can be reduced on a small small scale by the aid of sulphuric acid, or if placed in a pile of stable manure decomposition will eventually be effected. The manure should, however, not be in a pile sufficiently large to cause any great unnatural heat. I would not advise the bones thus saved to be broadcast over a 20 acre field, but put where the effect will be shown, say on your grape vines, strawberry vines (being excellent for each) or something of that kind. You will thus very probably be enabled to have not only finer grapes, strawberries, &c., than your neighbors, but a better yield of corn, wheat, &c., also. How so? Why, if you have finer fruits as a result of scientific farming you will be stimulated to greater exertions and as a consequence instead of snoozing at five you will be found out looking after and cultivating your crops. Farming will have been rendered delightful. It is in this way that your corn, wheat crops, &c., may be made to go ahead from a small application of bones.

Therefore,
You that in fair farming would excell,
How much you farm regard not, but how well.

Save your bones.

Washington, D. C. B.

Suckering Corn.

I planted and am working about two acres of "Sanford corn," a variety originated, I believe, on Long Island, within the last three years. Wherever the soil is good, each stalk throws up two or more suckers, making each hill a mat of stalks and leaves similar to sorghum, and rendering the operation of suckering a most tedious and laborious operation. If suckering is essential, then this variety of corn is certainly not worth growing; for I feel assured it cannot be enough more prolific than our Ohio yellow corn, to compensate for the additional labor for suckering. But is suckering essential? Will, as is claimed by some, the ear be as large without disturbing the suckers as otherwise? L. [There is quite a difference of opinion among farmers in relation to the propriety of removing the suckers from growing cornstalks. The same difference occurs among theorists. Perhaps if the suckers could be removed just as they are beginning to form, it might throw the vigor of the plant into the ear-bearing stalk. The roots and leaves mutually depend on each other; and to strip off a large portion of the leaves of any plant while it is growing rapidly, must cut off supplies to the roots, and check general growth. This is the theory; but we want careful experiments to decide to what extent injury or benefit might result. Strip off the suckers from five rows, and leave them on five more, and so on alternately through the field. Measure the corn and weigh the fodder, and give us the result. To have the experiment complete, let the stripping be done at regular intervals from the formation of the suckers to the ripening of the ears.]—*Country Gentleman.*

Watering Horses.

The *Working Farmer* has the following suggestions, which are worthy of remembrance:

"Horses should be watered from a brook pond or river, and not from wells or springs, as the well water is hard and colder, while the running stream is soft and rather warm. The preference of horses is for the soft, even though it be muddy water, to that which is hard. Horses should be allowed in summer time at least four waterings a day, and half a bucketful at a time, and in winter a pailful may be allowed morning and evening which is sufficient to assuage their thirst without causing them to bloat or puff up. Care, however, should be taken that the horse is not put to work immediately after drinking a full bucket of water, especially if required to go fast, because digestion and severe exertion can never go on together, and moreover purging is apt to ensue. In some cases, broken wind or heaves is thus produced. Avoid giving warm or tepid water to horses that are often driven from home, because cold or well water will then perhaps be given them, which will be liable to produce a congestive chill followed by lung fever, and in some cases colic."

Agricultural.

Cotton and Corn Roots---Their Length and Position.

Eds. Southern Cultivator:—It would at first, seem probably that no more familiar subject than the above could be suggested to Southern planters. But inquiring upon it will convince any observer that little is really *known* about the natural history and the merest external characteristics of the plants we chiefly cultivate, so far as they exist *underground;* and that the *conjectures* we make vary widely from each other as they do from the truth. And yet the *underground* portion is that through which alone we exert influence upon the crops—the upper portion we look at, the roots we cultivate.

After looking in vain into two treatises on cotton, and after numerous inquiries, with most contradictory replies from various planters, I commenced some observations on the cotton plant itself, up to its present stage of growth, and intend to prosecute them through its future stages. The results have surprised me, and many older and better planters. Although there are probably some who are well informed on the subject, there are certainly many entirely ignorant of the extent and character of the roots of cotton and corn, and I propose, therefore, to give you the facts as I observed them. To ascertain them requires no learning, no knowledge of botany, chemistry or any other science, but simply the careful use of the eyes, the fingers not too delicate protected from the soil, and a few simple tools.

The following little table gives the results of a few observations made about the 10th of May:

Table of cotton roots, in inches:

	No. 1.	No. 2.	No. 3.	No. 4.	No. 5.
Height	2	2	2½	2½	2½
Tap Root...	3	5½	4	4	
Lat'al Root.	1½	2	2	3	4
Depth		1½	1½	.	1¾

Of stalks 2 to 2½ inches high, the tap root averaged about 4 inches, and the lateral root about 2½.

A few days later, about the 20th of May, when the plant was somewhat advanced, other observations were made, with the following results:

SECOND TABLE.

	No. 1.	No. 2.	No. 3.	No. 4.
Height............	4½	4	4½	5½
Tap Root.........	8	7	10	
Lateral Root......	4½	4½	12½	14
Depth	2	2	2¾	2½

May 24th.
1 stalk 3½ inches high. Lateral Root 13.
1 " 5½ " " " " 14.

May 28th. Small stalks after rain.

Height stalk.	Tap.	Lat'al.	Depth.	No. Leaves.
2½	4	6	..	4
1½	6	..	..	2
2	9	3	3	4
1	2	2¾	1½	2
1¾	6	..	..	2
2	5½	..	..	2
—	—	—	—	—
Av'ge. 2	5⅓	4		

I think that, in the first two observations, I broke the lateral roots without discovering it, as they are extremely delicate and the ground was hard. The third observation was the most careful. A friend (Dr. T. L. Anderson, a nice observer and much interested in such matters,) went with me to the field, and we took with us a spade, with which we dug down on one side of a cotton stalk, about twelve inches deep, throwing out about a bushel of dirt. When, with a tub of water at command we threw a jet from a syringe on the lateral roots, gradually undermining them. Without some such means, they were so small and tender, we could not follow them without breaking. We traced several lateral roots to the length of ten inches or more—the longest twelve and a half inches. The tap root went down ten inches to a small stone. The longest roots left the tap root between one and three quarters and three and three-quarter inches below the surface, and were nearly horizontal through their whole course.—From the lower part of the tap root, lateral roots extended three to six inches, growing shorter as they went down. The general outline of the mass of roots resembled the form of a flat turnip, bulging out near the surface, and rapidly diminishing in bulk lower down.

It will be seen that, of stalks from four to six inches, the tap root was from seven to ten inches—the lateral roots from four inches (unless these shorter ones were broken) to twelve or fourteen.

COMMENTS.

The plants observed, it will be seen, extended under ground much more than above ground. With such stalks as was observed, averaging about five inches high, the roots in three feet rows would cover two-thirds of the rows, leaving but one foot in the middle not reached by roots.

For the development of this significant plant. (in its external appearance,) a box would have been needed as large around as a rice cask and ten inches deep, holding more than two bushels of earth. The particular stalk was four and a half inches high, to the highest point, as it stood naturally on the ground, three and three quarter inches high to the bud; had six leaves and a small bud at the top—was planted April 15th, had no rain after April 30th, and was observed after three weeks of dry, hot weather, on the 20th of May.

I thought of sending you a cut of life size, but the double page of the *Cultivator* would be too small. It would require a sheet fifteen inches by twenty-five to represent it.

A plow running within six inches of the cotton, two inches deep, would have cut some of the principle roots, and three inches deep, nearly all of those extending at right angles to.

CORN ROOTS.

I expected to find these more extended than those of cotton, but was surprised at the degree of difference between them. Being much larger and more tenacious than cotton roots, they can be easily traced with the aid of a garden trowel and the finger, but much earth has to be displaced and the tracing goes deep, and into hard ground.

The form of the aggregate mass of roots is that of an inverted saucer, or an umbrella, with the apex two and a half to three and a half feet under ground and the ribs extending downwards.

Table of corn roots—inches:

	No. 1.	No. 2.	No. 3.	No. 4.
Height to bud....	2	2⅓	4	4½
Top as it stands...	4	6	9	10
Length of root...	7½	12	13	30½
Depth at stalk....	2¼	2⅓	2½	2¾
Depth at end......		6	8	12

To have accommodated the roots of a stalk, ten inches high as it stood above ground, without cramping the growth, would have required a box five feet in diameter and a foot deep, holding about fifteen bushels of earth which would weigh about 1200 pounds, and be an ordinary two horse load.

To represent it on paper of life size, would require a sheet as long as Bonner's map of Georgia, and half as wide.

The roots form a crown around the stalk, leaving the stem about three inches below the surface and bending downward at about the rate of one inch deeper for every three inches of increased length.

In *rich* ground, the roots instead of growing larger, are not so long but more ramified than in poorer, especially in light sandy soil.

I think some of your readers can find, in this matter of observing the roots of plants, an interesting branch of practical inquiry. A knowledge of the physical conformation of the part of the plant which lies underground, will enlighten us as the proper modes of preparation, cultivation and fertilizing to advantage. We should not work in the dark upon the only part of the plant on which we can work at all. Only through the roots can we reach the other parts of the plant—its stem, branches, leaves and fruit.

I hope this statement of facts may lead to some careful observations on the part of others, who will make public the result of their investigations.

Yours Respectfully,
Samuel Barnett.
Washington, Ga., May 22, 1870.

P. S.—It will be observed that I give no opinion as to the effect of cutting the roots, whether of corn or cotton, but only some facts as to their length and position. To understand thoroughly the consequences of working them, would require considerable observation, and may vary materially with the stage of the plant's growth, the subsequent seasons, and the texture of the soil. S. B.

Climatology---Clouds and Rains.

Rain is always caused by a cooling—more or less sudden—of the atmosphere. The general principle upon which this depends is usually explained by supposing the air to have an affinity for water, or a kind of capacity to take it up like a sponge. Careful experiments have shown that this is incorrect. The phenomena of evaporation and condensation of water are precisely the same in a vacuum or clossed vessel where no air is present it is always necessary to take into account the pressure to which the enclosed fluid is subject; this renders the necsary terms very prolix. In the open air the pressure is always nearly the same; about fifteen pounds on the square inch, varying something more than a pound in extreme changes of the weather. Hence the pressure may be left out of the account and the condensing vapor explained by the usual method, if we remember that the same degrees of heat evaporates the same amount of water under a pressure of fifteen pounds to the square inch as well out of the air as in it, and the same degree of cold condenses an equal amount.

The capacity of the air to take up the vapor of water increases in a very rapid ratio with the increase of heat. If a certain volume of air at the temperature of fifty degrees would take up one pound of water, the same volume of air if heated to one hundred degrees would take up nearly five pounds of water. Upon cooling, the reverse process takes place. If the atmosphere is saturated with moisture or has as much vapor as it will hold, which is seldom the case, then a slight cooling of the air will cause a large proportion of the water to be precipitated; such a state of the atmosphere is nearly attained at certain seasons in the tropics, when a fall of a few degrees in the temperature will cause a heavy rain. The change of temperature of the earth during the day is sufficient to effect this, and there is consequently at that season a brisk rain every day at the same hour of the day for several weeks.

The phenomenon of warm rain thawing the frost and snow in cold countries would seem to contradict the general proposition that all rain is caused by cooling the air. But though the effect seems different, the cause is the same. While the air in such localities is cold, a warmer current laden with vapor sets in, and as it cools, of course loses a part of its vapor which condenses and falls in the form of rain; the atmosphere of the locality getting warmer at the same time.

The accession of cold currents of air, mingling with a warm present atmosphere and causing rain is of daily experience. A very cold wind sometimes rises without causing rain; but in such a case it sweeps along the ground the warm air rising and the two volumes of air do not immediately mingle. A black cloud forms at the junction of the cold and warm air, a cold gray cloud also forms at a low elevation, which is the upper limit of the cold stratum and the lower limit or base of the warm stratum. The warm air cools slowly and settles mixing with that below, causing a slow drizzling rain, which is, however, often prevented by the exceeding dryness of the air in the cold current.

Vapor or steam is perfectly transparent and invisible as the atmosphere. It is a gas, and indeed there are good reasons for believing that all gases are vapors of fluids. The mist which is seen rising from a boiling kettle and from the scape of steam engines, is formed of minute globules of water condensed from the steam and floating in the air. Fogs and clouds are of the same composition. Clouds are fogs and usually not dense fogs. The amount of water of which they consist in that visible form is not very great. They are signs displayed along the sides of currents or strata of air heavily laden with vapor, and serve in the econmy of nature to shade the ground before and after rain, to preserve the scanty heat of the earth from radiating too rapidly at night and in winter, and by accumulating charges of electricity, causes the phenomena of lightning and thunder by which the condensing of the vapor is facilitated, the atmosphere purified, and all animated nature loudly warned of the approach of great or sudden weather.

But a small part of a rain is formed from the cloud which is visible before the rain begins. The invisible vapor in the air is the chief fountain, the rain falling as fast as it condenses. Single drops of water are often observed to fall in clear weather, and they are portentous of rain, because they show that some stratum of air in the vicinity is saturated with vapor, and a slight reduction of temperature will suffice to precipitate it. When fogs tend to form in drops and fall to the ground it is a sign of rain for the same reason. Clouds nearly always accompany rain, but considerable showers have been known without them. A sprinkle of rain is often observed to fall in showery weather when the sky is clear, and they indicate a continuance of rainy weather because they show the presence of great moisture in the air.

Fecundity of the Queen Bee.

In a paper read by Mr. Desborough before the Entomological Society, he makes the following extraordinary statement, to quote from the published report of the meeting: "The author had succeeded in ascertaining that in certain cases the queen bee will surve and deposit eggs, during not fewer than six seasons, whereas the worker bees only live about eight months. A single queen bee had produced as many as 108,000 eggs, which would be about 20,000 a year; but the greatest amount of eggs, was deposited during the first two years of her life, only about 15,000 being laid during each of the last three years." With regard to the longevity of the queen bee I have little to say, except that I do not believe, as a rule, her existence extends to more than four years. In all my experience I have never known the life of any to exceed that period of time. The workers may and do live about eight months during the late autumn, winter and spring, but on an average, during the summer, their lives do not exceed three or four months. But it is with respect to Mr. Desborough's statement as to the fecundity of the queen, that I must take entire exception. A healthy, vigorous queen, at the head of a strong and prosperous colony, in a well proportioned hive, instead of laying only 108,000 eggs in the course of her life of—according to the author—six years, will lay much nearer 100,000 eggs in one season. I have myself had hives in which I have been quite certain that the queen has laid at least 70,000 eggs in a single year; and I have had and heard of other hives in which I have no doubt that the numbers far exceed that amount. I have also had occasion to notice that the fertility of a queen is most abundant in the third season of her life, a great change for the worse taking place in her fourth or last year. It appears to me most probable that Mr. Desborough has drawn his inferences from observations of a colony domiciled in a glass observatory hive. It must be obvious to every one that bees under such circumstances must be labouring under very great disadvantages; their energies are cramped in every way, and the breeding powers of the ordinary bees, cannot have full scope for their development.—S. Bevan Fox, in *London Farmer's Journal.*

☞ The war in Cuba gives more than unusual prominence to the article of sugar, and it is fair to assume that, with a favorable season, the product of our maple orchards will be larger than wheat. Farmers, having a few well developed maples in their reserved fronts, might make it pay to bring them into sugar producers with trifling cost, and little or no detriment to the trees themselves.