TYPICAL SCENES AT THE DEPARTMENT OF AGRICULTURE

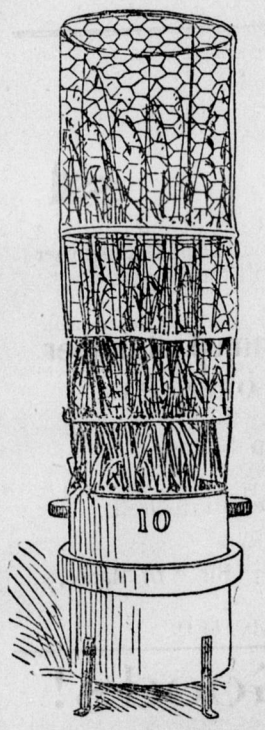
STUDYING SAMPLE SOILS.

The Department of Agriculture in Washington has been wise in retaining during several successive administrations its able Chief of the Division of Chemistry. The result has been, declares the Scientific American, from which this article is taken, that during the years of his tenure of office, Dr. Harvey W. Wiley has been able to plan and complete several valuable series of experiments. None of these, perhaps, has occupied his closer interest and attention more than those which have had for their object the study of the growth of various plants under similar conditions but with varying soils. In fact, the investigation may be designated as a study of typical soils, and is perhaps the first attempt ever made in this country to study any number of soils under like conditions.

In a way the work is an extension of that most excellent series of studies that have been carried on at the celebrated Experiment Station in Rothamsted, England, under the direction of Sir John Henry Gilbert and Sir John Bennett Lawes, who for more than half a century have had charge of the scientific work in that place.

Typical soils from between thirty and forty places scattered throughout the United States were procured through the agencies of the Department of Agriculture, and a direct comparison was instituted with samples of soils of known constituents obtained from Rothamsted.

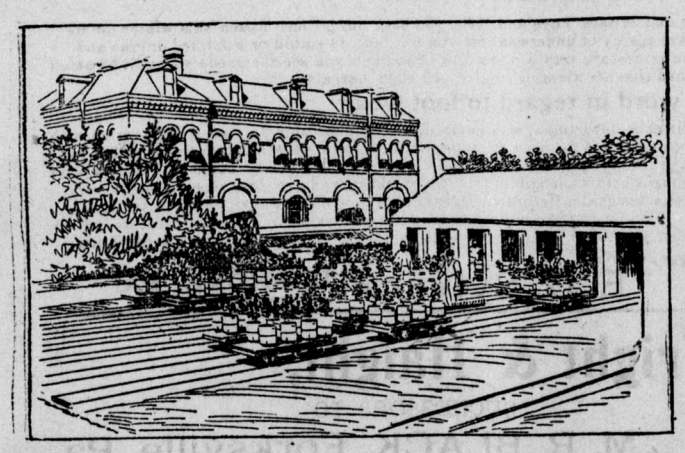
A plot of ground in the rear of the main building of the Agricultural Department at Washington was set aside for these experiments, which were begun in 1892, and a small green-house



VEGETATION POT CONTAINING GROWING OATS.

erected in which the plants are kept during the night and in rainy weather, but at other times they are rolled out into the air. This is easily accomplished, as the pots are all on trucks which may be moved at will along the tracks, as shown in the illustrations.

For a portion of the season oats and beans were grown in duplicate samples of typical soils. After the crops from these plants had been harvested, the



THE DEPARTMENT OF AGRICULTURE, WASHINGTON, D. C.—THE VEGETATION HOUSE AND CARS OF THE DIVISION OF CHEMISTRY FOR THE STUDY OF SOILS.

soil in the pots was again prepared for planting, and a crop of buckwheat grown. By this means two crops are secured during each season, so that the value of the experiment is largely increased, in consequence of duplicating the data obtained.

Very careful attention is naturally given to the water supplied to the pots, and formerly at proper intervals a known amount of distilled water was added to the soil by means of glass measuring vessels, but as the work has progressed, these have been discarded and a number of tin vessels, each holding two pounds of distilled water, have been substituted. As the amount of water added to every pot must be known (so that the conditions may be identical), this improved method makes it possible to add one portion of water to each of the pots in the course of two hours. This is accomplished by inserting the tin funnels containing water in the funnel holder on the side of the pot, as shown in the illustration.

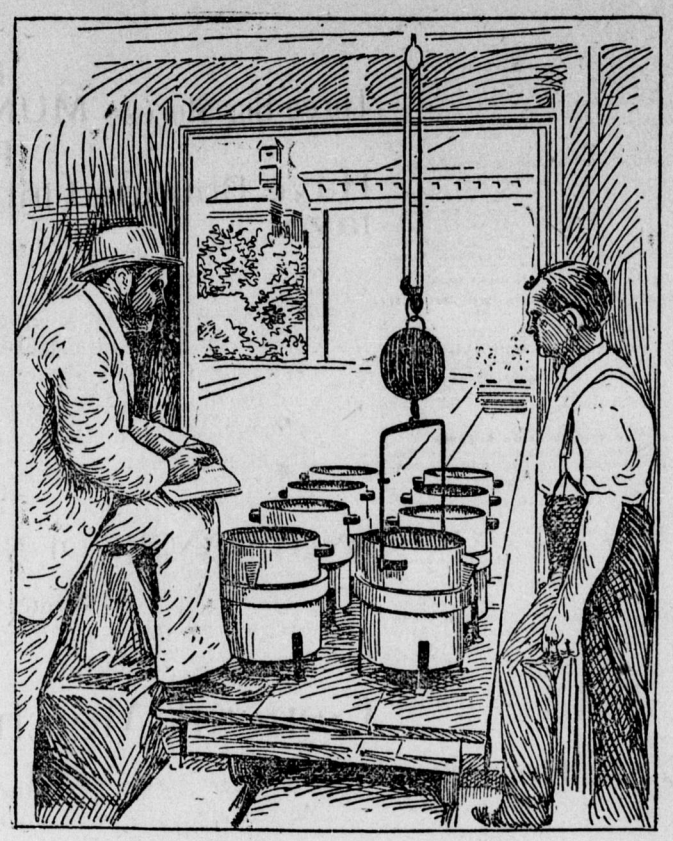
Next perhaps in importance to the addition of water to the soil is the determination of the amount of moisture contained in the pot at any given period. For a long time this factor was determined chiefly by an inspection of the surface, with an occasional weighing of the pot. This method, while capable of yielding excellent results when under the immediate supervision of an expert, was frequently interrupted, owing to the absence of Dr. Wiley, who was liable to be called elsewhere by other duties. Accordingly, it was deemed advantageous to have a more rigid control of the quantity of moisture present. Consequently, weekly weighings of the pots are now made, so that the quantity of moisture which has been evaporated during the seven days may be directly determined. Knowing the quantity necessary to produce complete saturation of the soil, a simple calculation will show the quantity to be added in order that the amount of moisture in the soil shall be between sixty and seventy per cent. of the total quantity necessary for its complete saturation.

For a time the weighing of each individual pot not only consumed a large amount of time, but also proved a very arduous undertaking for the attendant in charge of the pots. Accordingly, the method of weighing was improved by an ingenious mechanical device which renders it possible for one person, without assistance and without undue physical exertion in the way of lifting the pots, to weigh the entire lot of 176 in about four hours. This is shown in one of the accompanying illustrations, which is also of special interest as showing Dr. Wiley himself in the act of writing down the weights.

The single-column illustration shows the screen or hood that has been devised for the purpose of protecting the plants from the action of the wind and from the attacks of birds.

The laboratory work includes determinations of the total amount of dry matter produced in each pot, together with the amounts of nitrogen, phosphoric acid, and potash removed from the soil by each crop. The data from seven seasons is now at hand, and the preparation of a preliminary report is under way. It will contain statements in regard to the composition of the soils, their physical character, their water-holding capacity, their contents of humus, and the percentage of nitrogen, phosphoric acid, and potash contained therein, both as regards total content and in respect of the quantities removed by different solvents. This report will be illustrated, not only by analytical tables, but also graphically in such a way as to show in the most evident manner the relation which exists between the physical composition of the soil, its contents of moisture, and the quantity of dry organic matter produced.

This is but one of several investigations now being conducted under the direction of the Chief of the Chemical Division of the Department of Agriculture. The great value to the farmer is obvious, for as a result of this investigation a chemical analysis



DR. H. W. WILEY WEIGHING VEGETATION POTS.

of a given soil will at once determine what plant foods may be deficient in it for the production of a given crop and at the same time it will show the farmer how to supply these deficiencies when practicable by the judicious application of fertilizers or by a suitable rotation of crops. Thus in the end it will demonstrate what crops grown on a given soil will yield the greatest amount of profit to the farmer.

The slow and even tedious work necessary for the satisfactory completion of investigations carried on in the scientific bureaus of our Government is not always appreciated by the general public, but when the results that are sure to ensue are so far-reaching in effects as those of the investigation which has just been so briefly outlined, then, indeed, does the wisdom of the work become clearly manifest.

Went to Jail For a Dog.

Mark A. Diamond, who died at the Charity Hospital here recently, had become locally famous on account of his love for his dog.

Three times Diamond had been to jail to save the dog's life, and the dog survives his master. It was not a dog with a pedigree upon which Diamond lavished his affection, but a plain everyday cur with a bad temper. This bad temper caused all the trouble. The dog bit a child about a year ago and Diamond was arrested on the charge of keeping a vicious canine. Recorder Finnegan gave him the alternative of killing the brute or going to jail. Diamond went to jail. The same thing happened over again when Diamond had served out his first sentence.

The second term having expired, he was again with his dog, which celebrated his release by biting a young man ten days ago. Diamond's health was poor and the case against him was continued two or three times, the accused saying he would suffer imprisonment again rather than have his pet put to death. On his way from the Court House several days ago he fell unconscious in the street and was taken to the Charity Hospital, where death came this morning. The case has aroused much sympathy.—New Orleans Dispatch to Baltimore Sun.

Glove-Making Animals.

Among the more popular materials used in modern glove-making are kid, lamb, buck, doe and dog skins. The kids are specially reared for the use of their hides. They are all kept in pens, and thus are prevented from injuring their skins against hedges, palings or rocks. They are fed only with milk, so as to preserve the quality of the hide, which becomes very delicate, and, naturally, more valuable. At one time Senator Mackay, of Nevada, conceived the idea of buying up all the goats in the world, so as to obtain a monopoly of kid leather, but the scheme did not flourish. Following closely upon this was a plan projected by several French capitalists to catch all the rats in Chicago and establish a preserve which would supply the French glove-makers with ratskins to be converted into "kid" gloves.—Woman's Home Companion.

Man's Ingratitude to His Horse.

Spokane, the horse that beat Proctor Knott in one of the finest Derbys that was ever run, winning his owner $30,000 and the fleeting but bright renown of the turf, has been brought back to the scene of his former triumphs and sold at auction for a paltry $170. Once a horse that kings would have been proud to own, now he stands the chance of becoming a miserable hack in a road-wagon. The ingratitude that men who own racehorses show to the animals which served them so well is an old story.—Louisville Courier-Journal.

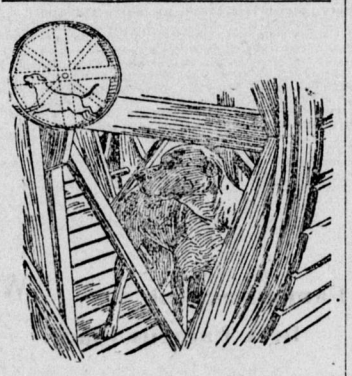
A TREADMILL DOG.

One That Runs a Printing Press in a Wisconsin Establishment.

A dog which runs a press is a curiosity in Plymouth, Wis., and is probably the only animal in the world doing this kind of service. "Gyp," as the dog is known, is owned by the Plymouth Review Company, and not only runs off the edition of the paper once a week, but is also employed to run a large job press.

The dog is an English mastiff, weighing 150 pounds, and formerly belonged to a showman who became stranded there and left the animal at one of the hotels. The proprietors of the Review secured him, and his tricks of operating a wheel were developed.

A wooden wheel, eight feet in diameter and four feet wide, was constructed and balanced on a shaft on the end of which was placed a pully to drive a main shaft. This shaft was connected with a nine-column power press, capable of carrying the forms of a six-column quarto paper. In the wheel Gyp was placed and in a short time taught to tread. Though usually tractable, there are two things which throw the dog into a rage. The first is to have any one turn the wheel, which Gyp has come to look upon as his own, and second the sight of a particular cat. The latter fact is taken advantage of when the dog does not tread fast enough. A glimpse of the cat is sufficient to increase the speed of the wheel, and if the cat is



THIS DOG PRINTS A NEWSPAPER.

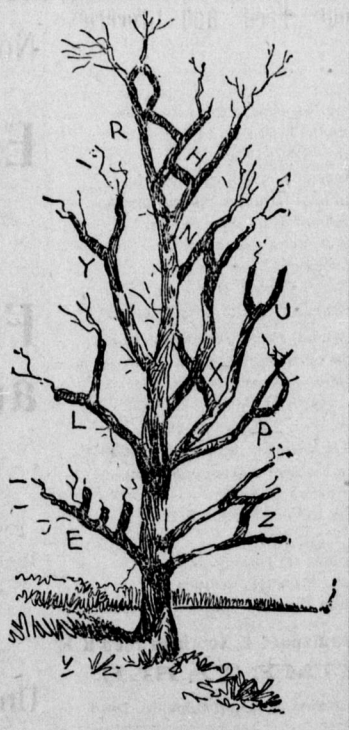
not taken away after a time the dog would work himself into such a passion that the press would be torn to pieces by the speed. Gyp has been doing the work for two years, never missing a day, and seems to enjoy the work, frequently getting into the wheel in the middle of the night and running half an hour or more just to "warm up," as it were. When commanded, the dog will start up or stop like a horse.

This Tree Is Learning the Alphabet.

There is a curious oak tree on the New Jersey bank of the Hudson River whose gnarled, misshapen branches clearly form nine letters of the alphabet. It is known throughout iis neighborhood as the alphabet tree.

It stands a few feet back from the water's edge nearly opposite 155th street, New York City. In the summer its rugged irregular branches are covered with thick foliage which completely hides the letters traced by the branches, but when the leaves disappear its curious orthography is outlined clearly against the sky.

The alphabet tree stands upon historic ground. At the time of the Revolution this spot was several times visited by Washington and was once the camp of the colonial army.



THE ALPHABET TREE.

One of the most remarkable of the limb formations near the top of the tree form the letter "R," clearly marked out by half a dozen oddly crooked branches, and below it a perfect "H" has been formed in the same way.

A little lower down there is a perfect "X," and near it a well-defined capital "N." The lower branches are decorated with an "E," a trifle misshapen, an "L" and a "Z." A curious curved fork at the end of a short, straight limb make a monster "U," and there are in all three "Y's" on the tree and a creditable capital "P." In addition to these are a number of other letters not so clearly formed which many persons have discovered.

In 1800 New York City got its water out of wells.

FOR FARM AND GARDEN.

Digestors for Pig Food.

An agricultural paper suggests the following as aids to digestion for the pig pen:

First: A mixture of six pounds of salt to a bushel of wood ashes.

Second: To six bushels of charcoal broken fine add six pounds of salt, one bushel wheat shorts and 1 1-4 pounds of copperas dissolved in a pail of water.

Third: One bushel of wood ashes, four pounds of charcoal, six pounds of salt and 1 1-4 pounds of copperas dissolved in a pail of water.

One or the other of these should be kept in an open box—but protected from the weather—in every pig pen and where the animals may help themselves.—New York Weekly Witness.

Manuring Fruit Trees in Winter.

Manures applied to trees when their buds are dormant, as in winter, are sure to largely increase wood growth the following year, especially on young, vigorous trees. Even when examination of the buds shows that the tree will blossom freely next spring, it is not safe to apply now much rich manure, as it will make so much sap that the blossom will be drowned out and not set its fruit. This is often the reason why fruit fails to set where there are plenty of blossoms. Only old trees can be thus manured with certainty that the manure will help the fruit yield. And even when manuring old trees, potash and phosphate in available form are better than stable manure or other fertilizers rich in nitrogen.

Heifers Going Dry Too Long.

If there is any carelessness in milking it is apt to occur when heifers are milked after their first calf. Their teats are small, and it is slow, hard work to draw the last drops from the udder, as should always be done. Besides, the heifer that calved last spring probably gives only a small mess at the best, and there is great temptation to dry her off, as the milk she gives scarcely pays the trouble of milking. But that is not the main point. Keeping the heifer up to her usual flow of milk is all important for her own future value as a cow. When a heifer is allowed to go dry two, three or four months, the cow is afterwards extremely liable to stop further milk production at about the same time.

The Cause of Mottled Butter.

The prime cause of mottles is the use of too cold water in washing the butter and the manner in which it is introduced into the churn. By using too cold water the outside of the butter granules becomes crusted or hardened like the shell of an egg, while the inside is soft. Now, when this mass is worked together these little shells remain in the same condition, and no amount of working or tempering salt, or even distribution of salt when added, will change the conditions. They do not work up, consequently do not take salt, hence the fine, threadlike streaks in the butter.

The manner in which the water is introduced into the churn is responsible for the large mottles or seeming lumps of white butter throughout the mass. In the majority of creameries throughout the country the water is pumped directly into the churn, either through a hose or a pipe. Now, when the water strikes the butter these granules become hard and solid as in the first case, only that these hard granules are not broken down at all, and the large mottles are the result. The wash water should be tempered to within two or three degrees of the churn temperature.

Keeping Paths Open.

One of the most important winter works on the farm is to open the paths after each snowfall. Where the path lies across places that usually drift full of snow much of the work of keeping the path open may be avoided by removing the obstruction to the wind which causes the drift. Most generally a drifting snow remains several days, so that the path will drift full every night, even though no fresh snow has fallen. In opening roads a team of steady, stout oxen hitched to a sleigh, or sometimes to a stone sled, will make a broad path better than horses could do it. We have often seen, when a boy, most of the cattle in the neighborhood brought out to follow after an ox team and sled. By the time those had been driven twice over the road, it was considered safe for sleigh vehicles drawn by horses. A flock of sheep driven after all else will compact the snow best of all. But if snow drifts into the tracks thus made, it will often be piled nearly as high as the loose snow on either side. It may be all right so long as the cold weather lasts, but let a thaw come, and this solid snow must be abandoned, and a new track made in the loose snow on one side of what has been used during the winter.

Utilizing Farm Manures.

It is generally understood that all fertilizing elements must dissolve before they become plant food. Hence the more thoroughly decomposed they become in the compost heap, the more quickly rains and dews will dissolve them after they are applied to the soil. My plan of caring for farm manures is to make three bins by placing posts eight feet apart and siding up with boards. The size of these bins will be determined by the amount of waste to be converted into fertilizer. Board up the first and second bins three feet high. The third bin I make larger than the others, as it must hold the entire output of compost until it is distributed.

To prevent waste of the liquid manures by leaching, spread a thick layer of dry muck, peat or marsh sod over the bottom of the bins. This will act as an absorbent. If this is too much trouble put in a layer of coarse grass or straw instead. Bin No. 1 is to receive all fresh manures, night slops from the house, ashes, droppings from poultry houses and pig pens, old shoes, bones and trash of all kinds. Make bin No. 1 a general dumping ground for everything that can possibly be utilized, such as dish water and wash water, unless you have hogs and prefer to give this last to them. See that the stable manure and rubbish are thoroughly mixed in bin No. 1. By thus incorporating all the trash with the stable manure you prevent its heating too rapidly, or burning. Sprinkle lime, or better, sulphate of potash over all. This will hasten decomposition. Keep all the bins that contain anything covered with straw, earth or coarse grass to prevent the ammonia escaping.

Fork over contents of bin No. 1 a little every three or four days to thoroughly mix coarse with fine and in three or four days after bin No. 1 is full fork it all over into bin No. 2, then proceed to fill bin No. 1 again. When bin No. 1 is full this time, empty bin No. 2 into bin No. 3, and repeat the process with bin No. 1. Every plant that grows in garden or field has a taste for food peculiar to itself. The old shoes, bones and even the dead cat thrown into bin No. 1 and mixed with the other compost will find its way into the little rootlets of some plant.

While this method does not make a complete fertilizer for any special plant, it makes a most excellent general fertilizer. We are much too apt to think of worn out articles as dead or worthless matter. An article serves as long and well as it can in one form and then disintegrates only to allow the individual particles to come together in some new and often higher form.—C. M. Drake in New England Homestead.

Underdraining Muck Swamp.

There is a far better way to make use of a swamp of rich black muck than to draw it out, season it a year or two by exposure to freezing, and then spread it on uplands. No doubt there are places where this plan may pay, but it is not economy. The black muck is probably not nearly so rich in fertilizing material as is supposed, and so much handling of it as is required to draw it in its raw state, season it and then handle it again to apply it, very rarely pays. The better way is to make underdrains through the swamp, possibly if there is a great deal of water leading all these drains into an open ditch, which should have a growth of sod on its sides as early as possible. In two or three years frost will penetrate to the depth of two feet or more in the pliable muck, and the surface if left bare through the winter can easily be cultivated until it is as mellow as an ash heap.

Usually these muck swamps are underlaid with a clay subsoil. That is a good sign, for it means that less of the fertility has been washed away and lost. In all cases the drains should be put down deep enough to reach the clay, and some gravel should be put over the joints of the tile, so as to not only keep the clay from stopping the water from entering, but also to prevent the fine black mould from above from sifting into the tile. Sometimes when we get down to the clay springs of water will burst forth. Where a spring is found, much care will be required in laying the tile, as there will be a great deal of sand brought up by the water, and this is likely to get into and choke the tile. The best way probably is to leave an opening here in the drain and make a small pond there with the spring of water in the centre. It is slow, dirty work dredging out such a pond so as to have the water rise up from a lower depth than the drain. It will require attention every year to keep this hole from filling up. But such a spring once found will furnish water at any time through the open ditch into which the tile carries it.

After the swamp is drained, it should be cultivated with ordinary farm crops, but reserved for those which require mucky soil to do their best. If grain is sown it will probably make a rank growth of straw, which, lacking mineral fertility, will not be able to sustain its own weight. The grain crop will probably rust, and both that and the straw will prove a failure. But a drained muck bed fertilized with potash and phosphate makes a first rate place for celery, for cabbage and for corn. These can be better grown on the drained muck bed than on uplands fertilized with the swamp muck spread over them. Almost all mucky soils are deficient in potash. They are the remains of vegetation that has very little mineral matter in it. A dressing of phosphate and potash applied to mucky soils makes them almost as rich as fermented cow manure. In time the muck bed will waste away by exposure to the air, and for this reason it should every few years grow a crop of clover to renew the vegetable matter it has lost. It may seem needless where the soil is still black with the remains of old vegetation to plow under a clover growth, but the clover is far more nitrogenous than any vegetable matter this soil ever produced before, and it also contains a greater amount of mineral fertility. So there is probably no way of making clover produce a better effect than by growing it on soil which is apparently already full of vegetable matter.—American Cultivator.

An "ice-creeper," for wearing on the shoes in slippery streets, has been invented by a Missouri lady. It has small steel teeth to pierce the ice as the wearer walks and can be applied to the sole in 10 seconds.