

## On the Farm.

### WASTES ON THE FARM.

One of the things most forcibly impressing the merchant who feels a desire to return to the cultivation of the soil, is the waste and leakage which seem naturally a part of farm life. Any merchant who had the same leakages would soon be forced to call a meeting of his creditors and have very little on the dollar to give them in settlement.

How is it at the barnyard, that leak at which every farmer must first commence work to reach his mind? Journals on agriculture have for years been warning the farmer of the loss in shape of liquid potash and nitrogen, and still we find the farmer throwing his manure against the barn or into the barnyard, there to have its best elements leached out by rain. Such wastes denote a poor farmer and a bad business man. On nearly every farm of the farmer who will not or thinks he cannot provide tight floors and proper drainage to a receiving vault or tank, can be found absorbents which not only in themselves under proper manipulation become valuable as fertilizers, but will, when dried, be sufficient to absorb all excess of urine, and liquids from the stable. If you have available a muckhole or swamp, draw out a quantity of the muck or peaty soil, put it where it can dry and drain, and when shoveled over until all has been exposed to the air and it is nearly dry, you will have an absorbent which not only performs the function of saving almost all the valuable fertilizers of the stable, but in turn, by mingling with the potash present, makes available the valuable nitrogen in its own combination. The neglected swamp thus becomes one of the most valuable areas. Land plaster can also be used to great advantage with other absorbents to keep or hold nitrogen. While wood ashes added to the pile containing the muck will go to make up a fine fertilizer which shows great results when applied to the ground for beets, turnips and all root crops.

A very valuable source of revenue which is generally wasted consists of the dead animals. Instead of driving the dead horse, cow or dog to the woods or swamp, to pollute the air and feed the crows, a shallow trench or square about one foot deep and as large as needed should be dug in the earth the animal thrown in, then covered with two or three bushels of lime which has become granular by exposure to the air. Dried manure from the swamp should cover the whole pile well, and after a month or so the pile should be shoveled over occasionally. A few bushels of wood ashes added will greatly help to, in less than a year, make a complete fertilizer fine enough for any crop.

Another great leakage on the farm which greatly appeals to the business man is the neglect and waste of tools. Instead of housing them on the approach of winter, seeing that the metal parts are cleaned and covered with oil, the woodwork painted repairs made and all ready for next season's work, one sees on every side the machines exposed to the weather, the woodwork bare of paint and falling apart, the metal rusted, so that when needed they are generally out of repair, easily broken, and at a time most wanted the leakage becomes most apparent. At these two points lay the most glaring wastes.

In winter, see that your cattle are well housed, that the food for them is of the right kind and balance, that the grain has been ground, and that for this concession to their natural rights they are able to pay you well in milk, eggs, meat and work, for it is a great leakage not to have chickens hatched at proper time to arrive at the laying period when eggs are 10c a dozen. Then look after the cows, find how much milk each one gives, how much cream can be gathered, and if its formation is the right one for good butter, and if there is not one up to the standard, get on good terms with the butcher and make as good a bargain as possible for her and then buy your neighbor's best cow. Remember that the advantage of one cow over another of even 10 cents a day would in a year allow you to offer a price for the neighbor's best which he could not resist. It costs no more to feed the good milker than the scrub. See that they become new milk at the time most profitable for your market.

Then there are the horses. Stop the leak there by knowing if they are well and strong enough to pay for their keeping; keep them in good flesh by warm quarters, good bedding and ground feed. Know if their teeth are in proper shape to masticate their food so that perfect digestion may take place; see that their food and manger is sweet and clean so that stomach and bowels from it are not caused by fermentative material; learn if the horse has worms and if so set about to relieve him and tone up his system after with some good condition powder. Know that the food you give him is giving value to someone or something. See that the pig's warm, dry quarters and good food. Do not try to produce good pork by making a scavenger of him at the manure pile.

Farming is a business and nowhere are more business principles more needed or show better results when applied than on a farm, while neglect in any department means wastes and leakages which with the close competition which is now a part of all businesses, means if not stopped by one thing—

that instead of being with the front of the procession where there is much light and pleasure, you and yours must travel in the dust and heat with the rank and file of those who do not make the most of their opportunities.

### CURING HAY EARLY.

I am a staunch believer in early harvesting of hay, writes J. Dwight Judd. Almost anything of grass nature will make hay that stock will eat with a relish if cut and well cured in June. While this is true, it is also true that the choicest grasses if allowed to stand a month or six weeks longer may make nice looking hay that will command a good price in market, but if fed to milch cows we will find that we are obliged to supplement with heavier grain rations. One of the most important things the hay maker has to consider is selecting the right kind of weather to cure the crop after it is grown, for as yet we are dependent upon out of door conditions. Select days that are full of sunshine, and nights devoid of dew. To make hay in such weather is a light and inexpensive task. The horse rake should be in the field early in the afternoon that the hay may go in wind rows while it is warm. But if the work will be required the next day to prepare it for the barn. If we are obliged to make hay when clouds are more prevalent than sunshine, we work and worry some, and use the tedder more.

### CHILLED CHICKS.

When young chicks are caught in a shower, fall into the swill larrel or wander through dewy grass and get "chilled to death" there is sometimes life left but it needs to be warmed up or else it will soon go out.

If the chick is still able to stand up, drying it off well with warm flannel and then placing in a warm place—the oven of the kitchen stove is the most common place on the farm where brood-ers are not had—will usually bring the little fellow back to life and activity. When the patient is stiff and cold more heroic measures are needed. Take the chick by the beak and both legs and plunge it into water at 120 degrees Fahrenheit at least. Keep the nostrils and eyes out but let all the rest go under. As the cold body cools the water, add more hot water to keep up the temperature. If he begins to kick and struggle do not treat him harshly, but soon remove him and dry off as mentioned above and give him a dry place, well wrapped in warm flannel.

This treatment will not bring a dead chick to life, but it will cause many a chick to live that would otherwise stay "dead" when cold and stiff from being chilled.

### CLOVER FOR SANDY SOIL.

On all kinds of soil, clover when fully grown, is a benefit. Its roots break up the heavy clay soils and makes them permeable to air and moisture. But on sandy soils a clover growth as often as every two or three years is a necessity. It is only thus that what vegetable matter it contains can be kept from being washed or burned away and wasted. It is often difficult to get a clover catch on sandy soil. Clover needs mineral fertility, both potash and phosphate of lime. In both these sandy soil is generally deficient. There is no better single manure for sandy soil than wood ashes. If from hard wood the ash will also furnish some lime and phosphate.

### SINGULAR AND GRIM.

Incidents in the War Between Russia and Turkey.

Proverbs, like grammatical rules, are liable to exceptions. For instance, the familiar saying, "Lightning does not strike twice in the same place," had its exception during the bombardment of Kalafat by the Russian batteries of the Danube. The incident is described by Doctor Ryan in his book, "Under the Red Crescent," the Turkish equivalent for the Red Cross Society.

The shells from the heavy siege-guns at Kalafat were dropping incessantly within the fortress. One of them, as it exploded, tore a great hole in the ground large enough to contain a horse. A Turkish woman, who was covering with her three children under the shadow of the wall, took refuge in the hole.

According to the law of chances it was the least likely spot to be again hit by a shell. But scarcely had she crept in and drawn the three children after her when another shell, leaving the cannon's mouth at Kalafat nearly two miles away, dropped into the same hole, and blew mother and children to atoms. To the Turks the grim execution was a vivid illustration of their doctrine of kismet, or fate. The woman's hour had come; kismet led her into that hole; it was the place assigned for her departure from earth. Another shell struck the angle of a house, tore down the walls, and reduced one-half of a room to ruins. In the other half of the room were a Turkish woman and two children; they were not even hurt. Their kismet, according to Turkish ideas, saved them.

### UNAPPRECIATIVE.

Palette felt disappointed because you didn't attend his exhibition of paintings. I was detained. But he kept the gallery open very late. Yes, that's what detained me until a little later.

## CORDITE AND ITS POWER.

### THE SO-CALLED SMOKELESS POWDER NOW USED IN BIG GUNS.

It is Really a Smokeless Propellant—Stages in Invention from the Black Powder to This Explosive—The Method of Manufacture—Its Constituents and High Ballistic Powers. Since the advent of the speedy torpedo boat and since rapid-firing guns have been placed on battleships and cruisers, an explosive that would allow to the officers and gunners an unobstructed view of an enemy under all conditions has been sought and thousands of dollars have been expended in the effort to obtain a satisfactory substitute for black gunpowder. Cordite, the latest explosive is said to be the most satisfactory propellant of modern times for naval warfare, and the general expert opinion seems to be that in a few years gunpowder as now understood will have vanished.

The earliest records of established powder mills show that there was only one in operation in 1580, this one being the Waltham Abbey Powder Mills were purchased by the English Government. They are still conducted by it. The Faversham Mills, which up to that date were the largest in the world, passed into the hands of a private corporation in 1815. The manufacture of powder was continued without much improvement, except in the efficiency of the grinding and mixing machinery, until about thirty-five years ago, the formula for black powder being saltpetre, 75 parts, charcoal 15 parts, and sulphur 10 parts, the whole forming a mechanical mixture and

### NOT A CHEMICAL COMPOUND.

The actual chemical result of the explosion of a charge of gunpowder cannot be told with accuracy. The general idea of what happens is that when the temperature of the igniting agent reaches 482 degrees Fahrenheit the sulphur bursts into flame the saltpetre, acted upon by the heat, frees the oxygen with which it is highly charged, and, combining with the charcoal, forms carbonic acid and oxide, while the nitrogen is liberated. The products of combustion are approximately 37 per cent. of solid matter and 63 per cent. of permanent gases.

In earlier days of ordinance only small grains of powder were used, but as the guns increased in size the size of the grains was also increased to pebble size and afterward to the various prismatic sizes and forms that were popular a decade ago. The reason for increasing the size of the powder grains was that the small grain powder gave a great igniting surface, and at times the charge was consumed before the projectile was fairly in motion, producing initial wave pressures in the breach of the gun that were of a highly dangerous character. With a larger grain there is less burning surface exposed, which naturally exerts a continuous force on the projectile until it reaches the muzzle of the gun. The results obtained were satisfactory to a degree, but there was some of the charge that was not consumed and left the muzzle of the gun along with the projectile.

With the prism powders came an alteration in the proportions of the explosive, which, from its brown color, was named cocoa powder. It contained saltpetre, 79 parts, charcoal, 18 parts, sulphur, 3 parts, the charcoal used being made from straw carbonized by steam. The carbon thus produced retained the amount of moisture required for pressing it into shape. With the introduction of quick-firing guns the "prism-brown" powders gave way gradually to smokeless explosives, which up to that time had been a dream of naval gunners.

**SMOKELESS POWDER** became absolutely a necessity, for the reason that smoke-producing powders masked the object aimed at, and the torpedo boat, which was becoming a recognized feature of naval warfare, would dash up and discharge one or more prismatic missiles under cover of the smoke.

Smokeless powders were first produced in France, and for some time the secret of the manufacture was guarded jealously. As soon as the necessity for this kind of powder became apparent, however, a number of manufacturers devoted attention to it, and as a result, various brands of smokeless explosives were placed on the market.

The most satisfactory results eventually made their appearance in cordite, which was produced through experiments made by Prof. Dewar and Sir Frederick Abel. Cordite is composed of nitro-glycerine, 58 per cent., gun-cotton, 37 per cent., and vaseline, 5 per cent. Nitro-glycerine is an oily, colorless liquid, and an active poison. It is produced by mixing a quantity of sulphuric acid, with almost double the amount of nitric acid and allowing it to cool; about one-eighth of the total weight of glycerine is then added gradually, the mixture being kept below a temperature of 70 degrees Fahrenheit, by passing air and cold water through it. After the mixture has stood a sufficient time, the acids are drawn off and the residue, nitro-glycerine, is washed and filtered.

Nitro-glycerine cannot be ignited easily by a flame, and a lighted match or taper plunged into it would be extinguished. It is sensitive to friction or percussion, either of which will detonate it. Another peculiarity is that the higher the temperature, the more sensitive it becomes. It will solidify at a

temperature of 40 degrees and its explosive force is estimated to be about twelve times that of gunpowder.

One of the most approved methods used in the manufacture of gun-cotton is this. The raw cotton is torn into shreds, dried and dipped in a mixture of sulphuric and nitric acids. It is then placed in a stream of running water and washed thoroughly. The cotton is then wrung out, usually in a centrifugal machine.

It is afterward, boiled, dried, cut into pulp, and

**PRESSED INTO DISKS.** When the gun-cotton is finished there should be no trace of the acids remaining. Vaseline, the other component part of cordite, is the well known extract from petroleum, and its usefulness is chiefly to lubricate the bore of the gun and thus lessen the friction between it and the projectile. It also has a tendency to impart a waterproof nature to cordite.

A colorless liquid prepared from acetate of lime, called acetone, is used as a solvent in the manufacture of cordite. The method of preparing the explosive is: The required proportion of nitro-glycerine is poured over the gun-cotton, and the two, with the addition of acetone are kneaded together into a stiff paste. Vaseline is then added and the whole compound after being thoroughly mixed is put into a machine and the cordite pressed out and cut into lengths, after which it is dried.

To the artist, the nature of cordite is represented by a fraction whose numerator gives in hundredths of an inch the diameter of the die through which the cordite has been pressed, its denominator being the length of the stick in inches. The cordite known as 30-12, which is the size used for the 16-inch quick-firing guns, signifies that its diameter is three-tenths of an inch and it is twelve inches long.

It is necessary to use a fine grain powder to ignite a charge of cordite, it being secured in such a manner that a flash from the tube firing the gun will cause the explosion of the charge. A full charge of powder for a 12-inch gun is 295 pounds, while the cordite charge having the same efficiency is only 167 1/2 pounds.

The wonderful strides made in the science of gunnery since 1840 is shown by the fact that at that period a 68-pound projectile fired with a charge of 18 pounds of powder gave a muzzle velocity of between 1,000 and 1,100 feet a second, while at the present day a 100-pound shell, fired with 14 3/4 pounds of cordite, gives a muzzle velocity of 2,630 feet a second.

Cordite is one of the safest explosives known, and is not dangerous unless it is confined. It can be held in the hand and lighted without danger. It burns slowly and with a bright flame. Although comparatively a new discovery, it is used extensively in every navy throughout the world. It was first manufactured in Great Britain and was in general use on her battleships before adopted by other powers.

### COAST DEFENCES OF ENGLAND.

Lacked Protection by Wires Which Centre in London.

It can no longer be said that Great Britain is unprotected. The coast defences were never more complete or efficient. Right around the shores stretch these many defences, not isolated and therefore of little account, but forming a linked protection, with the telegraph or telephone at hand to respond at naval headquarters in London to the slightest warning, and from Whitehall there branch off private wires to the great arsenals of Portsmouth, Devonport, Chatham, and Sheerness.

A few words from any point on the coast, be it an isolated coastguard station or a lonely guardship, may in an hour or two have led to orders of national import being flashed over sleeping towns and villages to the naval commanders-in-chief at the coast, and before the outside world knows of impending danger all the machinery of defence will be in readiness for any emergency. That this is no exaggeration those may judge who remember the hasty commissioning of the particular service squadron in January, 1896, when the German Emperor's ill-judged telegram to President Kruger set England ablaze with anger.

Before even the Times announced the decision of the Government to form this new squadron, "to do anything and go anywhere," as Mr. Goschen explained the telegraph instruments at Whitehall had been vigorously ticking, and unknown to the public, the Admirals at Chatham, Portsmouth and Devonport had had their orders. By the time the world was awake the preparations for commissioning the ships had commenced, and in a few days a squadron of powerful modern vessels was fitted out and ready for any task. When the necessity arises, no less promptly will the machinery of defence be again put to the test, possibly on a more extensive scale.

### NOT SINCERE.

Wheeler—What do you think of him? Van Byke—Oh! he is double-faced. He is all things to all men. Wheeler—What makes you think so? Van Byke—Why, the other day I showed him a new wheel I had bought. It was a different make from his, and yet he praised mine and said it was one of the best in the market.

### GIGANTIC POCKETBOOKS.

The Swedes and Norwegians carry their loose cash in immense pocket-books, some of these have been in use for two or three generations, and contain almost enough leather to make a pair of boots. A submarine cable is to be laid between Vancouver and Dyea.

## THE INVASION OF CUBA.

### FEEDING AND CLOTHING OF AN ARMY IN WAR TIME.

Uncle Sam Intends to Take Care of His Soldiers in Cuba—Elaborate Preparations Made as to Clothing, Food and Housing.

Great care is being given to the feeding, clothing, medical requirements and sanitary arrangements for the American army that is to invade Cuba. The island has the reputation of being a hotbed of miasma, where fever and other virulent diseases lie in wait for the unacclimated. Experts in the Bureau of Subsistence of the United States War Department believe that the dangers from the climate of Cuba have been grossly exaggerated. The officers in charge of the American army of invasion will not permit their troops to suffer from the exposure, neglect and privation which have caused the death of thousands of young Spanish recruits. The medical department of the army has also given much attention to the subject, and the troops who go to Cuba will be equipped to withstand the climate. Special clothing adapted to the hot season of the tropics will be provided for every man in the service. These clothes will not be made of canvas, but of new light material resembling the "khaki" worn by the British troops in India. In design the uniform will have the appearance of a shooting suit. The cap will be of canvas and the shoes of tan leather. Only the officers will wear hats, which will be turned up at the side like those of the Cubans and fastened with a rosette. This uniform will be decidedly light and admirably suited to the needs of the service. The poor Spanish soldiers owe their decimation by disease to the absolute lack of all these things. A line of communication with Key West will be maintained in order that

### FRESH SUPPLIES

for the army can be sent over at all times. Live cattle may be shipped to provide an ample quantity of fresh beef, as the department does not intend to let the men use salt meats more than is unavoidable. Fresh bread will be baked for the army and an abundance of fresh vegetables will be furnished from the gardens of the South. Very little canned stuff will be used. Provision will be made for boiling all water before it is used to drink, and no liquor will be allowed in the camps, as it is said, the abstainer from alcohol can best resist the danger from the tropical swamps. Lime juice pickles and vinegar will be largely used. The medical staff will have supplies of condensed milk and extract of beef for the diet of wounded men, and the Subsistence Bureau will supply at cost price a long list of extra articles. Officers or men will be able to purchase many luxuries without being led to death by the old-style "sutler." Among the articles thus obtainable will be evaporated apples, green corn, peas, peaches, oatmeal, sugar-cured ham, lard, sardines, condensed milk, smoked beef tongue, ginger cheese, mustard and red pepper. From the same sources they may also obtain briarwood pipes, chewing tobacco, smoking tobacco, glycerine toilet soap, pencils, pens, pen-holders, envelopes, notepaper, black ink, shoe blacking, blacking brushes, brooms, whisks, hairbrushes, toothbrushes, fine-toothed combs, handkerchiefs, safety matches, shoestrings, towels, tin handbasins, canteens, cotton thread, linen thread, needle books, needles, trousers buttons and metal polish for their equipments. Cornmeal and wheat flour will be provided also, but no butter. This the men will have only when they can obtain it from the inhabitants.

On the march the "travel ration" will be issued daily to groups of 100 men. This ration consists of 100 pounds of bread, 75 pounds of canned beef, 33 pounds of baked beans, 8 pounds of browned coffee, and 15 pounds of sugar.

### ON THE FOURTH DAY

each man will receive a pound of canned tomatoes. Whenever circumstances permit—that is, when not engaged in actual war—pepper, salt and candles will be supplied in addition to the above.

Owing to the miserable roads of Cuba the transportation of the wounded will present a serious problem. Ambulances or any kind of wheeled vehicles cannot be much used, so it will be necessary to carry wounded men on mule back or on hand litters. Portable ice machines will be carried by the medical staff, as ice is often an indispensable requisite for sick and wounded men. By the use of this small and light apparatus, operated by ammonia, sufficient ice can be made in any climate to provide for the sick and for several surgical operations.

Great care will be exercised with respect to the water used by the troops. Besides boiling it, all drinking water will be filtered through a germ-proof filter which has been adopted by the War Department. A sufficient number of these filters will be carried by the commissaries to provide abundance of pure water for the men whether in camp or on the march.

With all these precautions taken for the physical comfort and safety of the troops it is believed by the military authorities that the climate of Cuba will possess no terrors for them.

Well fed, suitably clothed and provided with up-to-date arms and accoutrements, they will be ready for any test to which they may be put.

The housing of the men in camp will be also carefully attended to. Each man will sleep in a hammock raised off the ground, and 100,000 tents will be supplied in sufficient quantities to shelter every man in the service.