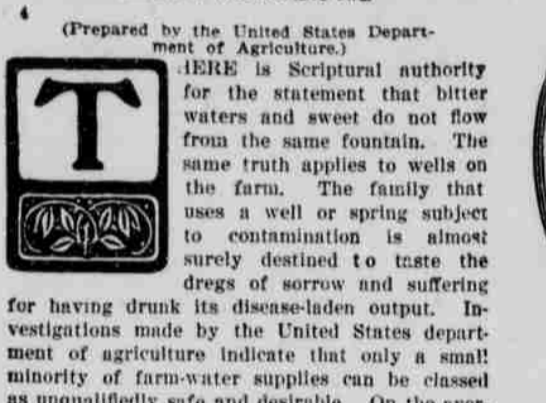


Bitter Waters and Sweet: Farm Water Systems



DELIGHT OF THE FARMER'S WIFE.

HERE is Scriptural authority for the statement that bitter waters and sweet do not flow from the same fountain. The same truth applies to wells on the farm. The family that uses a well or spring subject to contamination is almost surely destined to taste the dregs of sorrow and suffering for having drunk its disease-laden output. Investigations made by the United States department of agriculture indicate that only a small minority of farm-water supplies can be classed as unqualifiedly safe and desirable. On the average three out of four farm wells are located within 75 feet of a back door of the house and in the direction of the barnyard.

That convenience and first cost, not safety, have been the deciding factors in such cases is made evident by the nearness of barnyards, pig pens, pastures, fertilized fields, sink drains, privies, cesspools, and areas rendered insanitary by chickens, slops, and other filth. Too frequently the seepage from these and other sources, after joining the ground water, moves to wells and springs, impairing the water supply by impurity, and may be grossly poisonous.

Sewage Disposal.

Popular indifference to the effective disposal of sewage has existed so long and so universally that only within comparatively recent years has it been realized that this waste product of human life is poisonous and must be kept from the food and drink of man. From the specific germs or poison that may be carried in sewage at any time there may result typhoid fever, tuberculosis, hookworm disease, cholera, dysentery, diarrhea, and other ailments, and it is not improbable that certain obscure maladies may be traced eventually to the poisonous effects of drainage from human waste. The poison is invisible to the naked eye, and it may be carried by many agencies, by devils routes, and by unsuspectingly received into the human body. Typhoid fever is peculiarly a rural disease, and many instances clearly indicate serious neglect of responsibility with regard to sanitation by people who live in the country.

Pure Water the Need.

One of the first and obvious needs of American farms is pure water supply. From the standpoint of the housewife, second only in importance to purity, is the installation of a water system in the farm house that will save labor. Continued pumping will not improve water in a well if the sources which feed it are permanently at fault. Wells cannot be located in all cases to be wholly free from pollution, but the greatest safeguards are clean ground, and as wide separations as possible from the probable channels of impure drainage.

derground water is without merit, although "forked-stick" artists from experience often are better able to judge the probabilities of ground water than the average person.

Various Kinds of Wells.

Wells are spoken of as shallow or deep, dug, bored, driven, or drilled, and in the case of tubular wells, as nonflowing, flowing, or artesian. Persons interested in the various types of wells and their construction, advantages, disadvantages, etc., will find the subject treated in Farmers' Bulletin No. 941.

Wherever possible, the farmhouse should be fitted with some sort of running-water system, simple or elaborate, according to the investment the owner is able to make. For such systems water may be raised by natural flow, hydraulic rams, pumps, air lifts, or air-displacement pumps. Hydraulic rams are the most economical water-lifting devices. Since rams of various sizes and makes perform differently, it usually is necessary to accept the mechanical details determined by the manufacturer. The minimum, never more than the average, flow of the spring should determine the size of the ram. Otherwise, the one selected may be too large for the dry-weather flow. Small flows may be determined by noting the time required to fill a vessel of known capacity. Larger flows may be determined by weir measurements.

When the water supply is far from the ram site, it is usual to pipe the flow to an open tank or reservoir located so as to secure the desired length and fall of drive pipe. Sometimes the flow of a spring is too small to actuate a ram that is sufficient for domestic requirements. In such instances and where a nearby brook can be dammed to obtain the necessary power head, the recoil of the ram may be employed to admit the spring water, which is pumped by a fall of the brook water to the pipe drive.

Selection of Pump.

In the selection of a pump one should determine the kind of well to be used, its inside diameter, depth to the bottom, the depth cased, depth to the water level, both when the pump is at rest and in operation, and the maximum yield. The maximum quantity of water required per day should be calculated also. One should also determine the distance from the well to the proposed location of the pump and the vertical height between these points; likewise the distance from the pump to the reservoir or tank and the vertical height between these points. The kind of power to be employed should be settled upon also—hand power, windmill, gasoline or oil engines, or electric motors—and the method of transmitting the power.

a pump cannot be placed so that the limiting suction lift will not be exceeded, it is necessary to lower the pump cylinder into the well, raising the water from the cylinder to the spout by the direct lift of the piston. Water can be pushed more easily than it can be pulled, hence, rather than resort to extreme suction lifts it is preferable to lower the cylinder to within 15 feet or less of the supply, or still better to submerge it. Where water is discharged against pressure a force pump is necessary. A practical installation for the kitchen sink is a combined suction and force pump which will be found a great labor saver for the housewife.

Deep-Well Pumps.

Deep-well pumps are heavier and stronger than those described above. They may be of the lift or force type and the standard or working head is always directly over the well. The cylinder should be near (within 15 feet) or else below water level which pumping and drought may create. Submergence is the preferable arrangement. In all installations the size of the pumping cylinder must be determined from the size, depth, and yielding power of the well, the quantity of water required, and the available power. Deep wells and hand or windmill outfits take small cylinders.

Pumping by means of compressed air is very old, but the systems used prior to 1900 required the air supply to be turned on or shut off according to whether or not the water was needed. Based on a patent granted in that year, a two-cylinder air-displacement pump submerged in the water supply and controlled by the opening and closing of the faucet, was devised. The essential parts of installation, besides such a pump are an air compressor, storage tank, engine or motor—with air and water pipes, and minor attachments. The pump operates only when water is used, starting whenever a faucet is opened and continuing until all faucets are closed.

The chief advantage of air-displacement pumps is that water may be taken from ordinary depth or lateral distance, or from several sources, with one power outfit and delivered direct from the well to the faucet. The power plant may be located wherever convenient and as many pumps may be used as there are sources of water. Both hard and soft water may be delivered by using two pumps and the necessary piping systems. Air-displacement pumps are not adapted at present to lifts much over 125 feet or to wells less than three inches in diameter, nor can they be used where more water is required than the well can supply within a specified period. Air pipes and air-displacement pumps must be tight and remain tight in service, and working parts must be kept in good order.

Horsepower Needed.

Water may be raised by hand, windmill, bydraulic rams, steam, hot air, gas, internal-combustion engines, or electric motors. Hand power is unsuited to large supplies or high lifts. Windmills are probably the most familiar type of mechanical power used, and often are arranged to start and stop automatically. Gasoline and oil engines are well adapted to farm pumping, and may be equipped to stop at any desired pressure in a supply tank. The use of electricity for pumping is increasing. The method is clean, quiet, and convenient, and starting or stopping a distant pump by throwing a switch may be practical wherever transmission lines are sufficiently near.

The theoretical horsepower needed to raise water is found by multiplying the gallons pumped in one minute by the total lift, in feet, including friction in both suction and discharge pipes, and then dividing the product by 4,000. The horsepower, as computed, should be multiplied by from two to four to overcome losses in pumping and still allow for a reserve of power. Ordinarily one or two horsepower engines are sufficient for farm pumps, but it is always safest to determine this point by computation.

CONCRETE ON THE FARM.

If there is any one thing more than another that has aided the farmer in making his farmstead more attractive, his live stock more comfortable and his farm more valuable, it is concrete on the farm. It is one of the most economical and suitable farm-building materials. In permanency it cannot be surpassed, in fact, it is unequalled in this respect. Concrete is also one of the biggest factors in making buildings rat and mouse proof. Needless to say rats and mice have always been a constant menace to the farmers' grain bins and corncribs, but the widespread use of concrete on the farm has greatly reduced the damage done to stored grains.

BOY SCOUTS

(Conducted by National Council of the Boy Scouts of America.)

SCOUTS EMBODY BEST IDEALS

"During my four years in Germany," says James W. Gerard, former American ambassador, "I saw much of the child life of that country. The children were paraded through the streets singing their songs of hate. In the schools they were taught a deliberate perversion of history. For instance: The Fatherland did not wish to injure the Belgians, but the wicked Belgians promised to allow our troops to pass through their country and then attacked them."

How different are the methods that are used to bring out the best in the childhood of this, our own country! While the Germans had organizations which were intended to develop hatred and like passions in the hearts of the young, we have the Boy Scouts of America. This splendid organization well illustrates the difference in ideals between the two countries. In the Boy Scouts the boy subscribes to an oath to be true to himself and his country and to keep himself morally and physically fit at all times. He also pledges himself to "do a good turn daily."

The boy is taught woodcraft and many other useful things. He participates in big public functions and civic ceremonies. From the very first he is led into the higher citizenship.

PRISONERS AID SCOUT PLAN.

Through the gray of the granite walls that shut away the inmates of the Minnesota state prison from the rest of the world came this little story which shows that "stone walls do not a prison make nor iron bars a cage."

In the office of George D. Pratt, treasurer of the National Council, Boy Scouts of America, New York, a letter arrived from Stillwater—a letter containing \$28.50, "in payment of the following applications for associate membership in the National Council of the Boy Scouts of America."

Daniel Blue, Frank Meyers, Joseph Kelly, Charles Kramer, J. W. Schwartz, George Olson, Jacob Red Bird, N. A. Burke, August Ruther—all prisoners.

Far removed from the blue skies and running streams and long, winding roads that perhaps they themselves had trod in their boyhood, they looked back through the years, at the what-might-have-been, at the different lives they might have led had they been shown differently, and "came across" that other boys might have a fighting chance.

SCOUTS URGE AMERICANIZATION.

The executive board of the Boy Scouts of America has decided to strengthen its program for citizenship training in order that even a greater emphasis than before would be placed upon developing patriotism and Americanization.

It was also agreed that special effort would be made to develop a program for older boys, affording them an opportunity to "learn by doing," in preparing for citizenship responsibilities.

The executive board meeting was attended by Messrs. Walter W. Head, of Omaha; John M. Phillips, of Pittsburgh; George D. Porter, of Philadelphia; Alfred W. Dater, of Stamford; Hon. James J. Storrow, of Boston; Charles P. Nell and Colin H. Livingston, of Washington, D. C.; Mr. Daniel Carter Beard, of Flushing; John Sherman Hoyt, George D. Pratt, Lieut. Col. Theodore Roosevelt, Jeremiah W. Jenks and James E. West, of New York City.

Mortimer L. Schiff was selected as the representative of the Boy Scouts of America on the International Scout committee.

SPOKANE SCOUTS AS FIREMEN.

At a meeting of the fire prevention and fire insurance committee of the chamber of commerce in Spokane, Wash., it was decided to perfect a permanent organization to be known as the Spokane Scout Firemen.

The organization will consist of Boy Scouts who have passed certain examinations on fire prevention. Fire Chief A. L. Weeks will be ex-officio chief of the organization.

Deputy State Fire Marshal Grose stated at the meeting that he cited the boy scout fire organization as an example and incentive on his visit to other states and towns in the state. He had slides made of the Spokane scout fire exercises to induce other cities to follow Spokane's lead.

SCOUTS TO HAVE MOTOR CORPS.

The council of the Boy Scouts of America in Westchester county, New York, is making extensive plans for the development of an efficient county boy scouts motor corps.

Applications are being received at county headquarters from older boy scouts who have autos which can be of service for emergency calls.

As soon as the corps is efficiently organized, its services will be at the disposal of all legitimate organizations and other good causes.

TINY SCOUT IS ON THE JOB.

The Boy Scouts of Troop No. 1 of Elizabethtown, Pa., Scoutmaster C. M. Heistand, are very proud of the record of Roy Trechler, aged 12, the smallest boy in the troop.

While in camp with the troop he tore a hole in the calf of his leg on a nail. He never cried and wanted to administer first aid to himself, but was transported seven miles to a doctor. All that he said was, "The worst pain is that I cannot go back to camp with you."

BLACK LOCUST RECOMMENDED FOR WOODLOT



Black Locust Plantation, Trees Five Years Old.

(Prepared by the United States Department of Agriculture.)

Black locust—known also as "yellow locust"—is one of the most profitable and useful kinds of timber for the farm. The wood is heavy, hard, and particularly durable when used in the ground. For use as fence posts, black locust is long-lived and very desirable. Only one other wood gives longer service, namely, osage orange or "bois d'arc," which, however, nowhere occurs in abundance and is so hard that it is difficult to drive staples into it except when it is green.

Locust grows rapidly. Black locust grows rapidly and yields good-sized fence posts at an age of from fourteen to twenty years, according to the forest service. A worn-out field in middle Tennessee which, 20 years previously, had been planted with one-year-old locust seedlings, yielded fence posts worth \$188 an acre on the stump, or \$480 at the railroad about two miles distant. This was a gross return of \$9.40 an acre yearly on a hillside of fairly good soil which before the trees were set out had started to gully badly. Returns of \$5 to \$7 an acre annually have frequently been realized on poor, thin hill land. Good soils underlain with limestone and planted to black locust in the Appalachian and Piedmont regions, from Pennsylvania to Kentucky and Tennessee, can be counted on to yield an average of \$10 an acre yearly at the end of from 15 to 20 years.

The manufacture of insulator pins requires large amounts of black locust, for which purpose it is the most satisfactory wood.

Starting Black Locust.

In starting black locust, small sprouts with a portion of the root may be dug up and used; or, better, the seed may be sown in the spring in drills in good soil, like onion seed. At the end of the season the seedlings will be from two to four feet in height and satisfactory in size for setting out. This may be done in the late fall, but the spring season, about the time growth starts, is preferable. In some regions the locust wood borer is almost certain to cause extensive damage to young plantations unless special precautions are taken to keep the trees in a healthy growing condition and the bark shaded by foliage, either from nearby trees, shrubs, or weeds. Information on this insect and methods of its control will be found in United States Department of Agriculture Bulletin 787, "Protection From the Locust Borer."

Strange as it may appear, black locust, although one of the most durable woods when set in the ground, matures early and deteriorates in the tree rapidly if not cut when ripe. Commercially the tree is usually mature in 15 to 25 years.

Black Locust Utilizing Rocky Places on Farm Are Indications of Good Farm Management.

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GOOD TOP DRESS FOR WHEAT

Application of as Little as Two Tons of Manure Per Acre May Increase Yield Ten Bushels.

It pays a big profit to top dress wheat with manure. An application of as little as two tons per acre may increase the yield ten bushels; at least it has done this much one year with another in Indiana tests. Four tons make only about two bushels more. The manure benefits the wheat directly through the plantfood which it contains, and indirectly through the winter protection, which often is of greater value. Where manure is used as a top dressing the stand of clover is generally better. There is an organic benefit from the manure which is considerable and is not so easily explained. Where as much or more plantfood is applied in the form of commercial fertilizers the resulting yield has not been as large.

CUT STRAW IS BEST BEDDING

Much of Liquid Manure, Now Wasted, Can Be Saved by Use of Effective Absorbents.

A great deal of the liquid manure now going to waste can be saved by the use of absorbents, such as straw, sawdust, muck and loam. Uncut straw is a very valuable absorbent, taking up two or three times its weight of water, while fine cut straw will absorb six or nine times its weight of liquid. Moreover, cut straw contains quite a large amount of plantfood, especially potash.

NICE INCOMES FROM POULTRY

Raising Chickens Has Many Attractions for Those Who Enjoy Association With Fowls.

Poultry raising, like raising live stock in general, has many attractions for those who enjoy the work. Men and women often enjoy association with animals and fowls. There are women making nice incomes from poultry.

ESSENTIAL FOR EGG SHELLS

Limestone Grit, Oyster Shells or Ground Bone Must Be Supplied to Laying Hens.

An egg shell is composed almost entirely of lime. The bone of the fowl contains considerable lime, and also the body tissues to a more limited extent. Oyster shells, limestone grit or ground bone are essential in the ration.

KILL GOPHERS IN ORCHARDS

Rodents Delve Deep at This Time of Year and Sometimes Nest Under Cherry Trees.

Look out for gophers and get them now. In well-drained orchards they delve deep and nest under the root crown of your best cherry-tree without giving much evidence of it.

USED DICE TO TEST THEORY

University Students Employed the "Bones" to Demonstrate the Law of Recurring Numbers.

Some cracking good exponent of the art of "African golf," some trainer of the galloping dominoes, may yet get a position on the University of Minnesota faculty. Students in the class studying statistics the other day applied themselves to the fortunes of dice to prove or disprove certain rules of recurring numbers.

The theory they set out to test was that with three dice it is a certainty that a given number will fall to turn up 125 times, and will turn up 75 times on one die, 15 times on two dice, and once on all three of the dice, out of 216 throws. The students found that the rule worked, for the dice

came out 128, 74, 12 and 2.—St. Paul Dispatch.

No Smoking There.

A traffic jam at the corner of Sixth avenue and a street in the upper Fifth forced the woman to stop. Later she thanked her lucky star for the pause that made her a witness of an unusual scene.

There was a saloon on the corner, and a crowd had gathered at the "Family Entrance." Over the heads of the spectators she saw a fairly

well-dressed couple being ejected by the manager of the saloon. He was large and Irish and spoke with a delectable brogue.

"Sure," he indignantly yelled, "and it's me that'll tache ye not to smoke in the parlor of me saloon. I've got a sign up as big as yez please 'Ladies aren't allowed to smoke in here,' and it names what it says. Sure and if yez want to smoke ye can go where the sassidy women hang out and do it. But this is a respectable saloon."—New York Evening Sun.