Soils and Crops

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A Source of Farm Power.

Two fields were selected by the college officials for the demonstration of the value of explosives in farming. The first piece tried was a young apple orchard of about two acres. The ground was very soggy, particularly in a depressed area near the middle of the field, toward which the moisture from the higher ends of the piece slowly gravitated. The surface was dotted here and there with various sizes of boulders and gnarled tree stumps.

Selecting two rows of trees running through the field at nearly a central point, charges of dynamite were placed midway between the two rows, each charge about twenty feet from the next one. Each stick was exploded before another was placed. Varying strengths were used; in some cases a full charge of one-half pound, and in others only the half charge was used. The full charges, sunk to a depth of about six feet, resulted in an excavation some four feet deep by twelve feet in diameter. The ground was loosened to an area considerably greater. In the half charges, the result was proportionately less efficient.

After these charges had been made, running lengthwise the field for some distance both ways from the centre of the depressed area, operations were next begun on a line at right angles with the first rows worked. Charges were sunk two feet apart, beginning at the north boundary of the field and extending crossways in a line through the middle of this low area, to a point beyond the first rows of excavations. These charges were wired and, when all laid, were connected with a battery and were exploded simultaneously.

The result was a well-defined ditch four feet in width and the same in depth. Some of the dirt, of course, fell back from the sides, partly filling the opening but the whole was so loose and separated from the water as to be easily removed. This provided a logical and natural drainage ditch for the orchard; the surplus water from the higher parts was to be carried in tiles to this open ditch and from there run outside the field.

It is expected, however, that by loosening the subsoil at the higher end of the orchard that the water-level at these ends will be made lower than formerly; that the roots of the trees feeding from these areas will be given deeper soil from which to feed and soil that is made more rapidly and more perfectly available; that less water will be carried to this cross drain and consequently wasted; also that those trees feeding in this surrounding depressed area will not be drowned from too much water. In other words, the idea is that this orchard soil needs aerating for the more esuitable distribution of water and for the more ready and general availability of plant food.

Incidentally, in a little side by-play, several rocks and stumps about the orchard were made ready for easy removal. Some of the blasts were made with only one or two sticks; another needed ten one-half pound sticks laid on two different flat faces of the rock and plastered down with mud thrown on and patted down with a shovel. This method of blasting is somewhat less effective per unit of power than drilling into the rock but frequently saves much time and labor as well as being safer.

The next day operations were transferred to the other field, consisting of about two-thirds of an acre of corn land. Charges were laid and exploded one at a time at distances of twenty feet each way. The soil here was hard subsoil and sandy surface, and the excavations following the explosions brought considerable of the yellow hard-pan to the surface, also loosening the surface soil for a considerable distance back from the edges of the hole.

One-half of this piece was not treated. The plan is to drag over and sow each section to alfalfa seed and carefully follow the results of growth in the two plots for a long enough period to determine the actual and comparative yields.

In the case of reclaiming wet fields or of irrigating dry fields, explosives provide a quick, efficient and cheap method of opening drains and in preparing the waterways for the irrigating system. All this besides the very considerable value of clearing virgin fields of stumps and rocks. Altogether, there seems to be great possibilities in the use of dynamite for various operations in the development of land.

The Missing Link in Feeding

How This Link Was Discovered and What It Means to Farmers

BY EARLE W. GAGE.

Not long ago investigation showed that some fakers were actually selling farmers ground cocoanut shells as a special cattle food. A good many of the fattening and conditioning preparations were not very much better, it was found. But the shell of the cocoanut is practically hard wood, and it does seem abominable to give poor, ailing, breeding or growing brutes ground hardwood, as a medicinal food. And it was certainly hard upon the feeder to swindle him into paying his hard cash for such trash.

But, come to think of it, there is a place in our feeding bins for the shells of nuts—some nuts at any rate. The little oblong nuts on the wheat plant, for the wheat itself has a shell of its own, composed of what is much like wood. Everyone knows how valuable a stock feed this shell, husk, or bran is used in reason. For many years—back to times immemorial, bran has been used as a feed. But never so intelligently as since the latter half of the past century.

It was a lot of pigeons experimented upon by some scientists interested in feeding problems that made known to us the real value of bran and some other cattle feeds. The birds were fed with the polished rice, which is often sold in the stores and often tempts the good housewife by its handsome appearance. It is a fine old proverb which warns that "handsome is that handsome does," and so is that other which warns against judging by the outward appearance.

In a few days the pigeons fell sick. They developed the disease known commonly as beri-beri in men. Since in the case of human being, this terribly fatal disease is caused by an unbalanced food ration, the scientists set about restoring the balance in the pigeons' food by feeding them with rice-bran. It is unlikely-looking stuff to use as food, but this rice-bran turned the trick. The doves got well speedily and that set men to work to try to find out just what food substance it is in bran which gave it such value.

That was how it occurred that what are called by the rather clumsy name of "vitamines" came to be discovered. There was something lacking in the polished rice ration, as sailors found long ago there was something lacking in a preserved food ration. Green vegetables, and lime juice completed that latter ration it was discovered, and prevented scurvy.

But green vegetables and fruit juices could not prevent beri-beri from setting in. Nor could the bran—or a yeast which was found to have similar effect—that cured beri-beri, prevent scurvy.

Different things were lacking in the food rations it will be noticed. So far we have discovered three of these, the lack of which upsets the health of animals or man. For lack of better names they are usually known as vitamines A, B and C.

Vitamine A concerns growth. Without it growth is slow, the bone poor and resistance low.

Vitamine B is an anti-neuritic, a sort of nerve sustainer. Without it beri-beri and similar diseases of the nerve government, lack of virility, may be expected.

Vitamine C. is an anti-scorbutic. Without it scurvy and such troubles may occur.

Vitamines Essential to Life.

Evidently these vitamines are, and always have been necessary to animal life. Wild things get them naturally. It is because our animals are no longer wild, and no longer live and feed in their natural countries and manner, that we have to look after them artificially.

All animals whether meat-eaters or vegetable feeders, get their vitamines from plant life. It is true that meat, animal fats and milk contains vitamines, but they all come from vegetable life.

All food of animals must contain carbohydrates (sugar, starch or cellulose-fats), proteins—albuminoids, and certain salts. We have known that all our lives. To be perfect they must contain vitamines as well. Naturally we look for these first in vegetables. There is a lot to be found out yet about these principles. The farmer is, in fact, never going to be done with learning. And it looks as though the chemist is going to be his best teacher for a good many years to come. It might be a good thing to insist upon having chemistry taught in all the schools, instead of "dead languages" (which are seldom used by farmers).

In the future, the country which has the most competent, best trained farmers is going to take the lead when the war-tossed world settles back into its old, or should we rather say, settles well into its new stride. And the best trained farmers will be those who, among other necessary things, know their chemistry best.

We have already found out that certain vegetation is richer in vitamines than others. Cabbages—or the cruciferal as their family is called—are very rich in vitamine C, for example. Young plants are much richer in vitamines than others. Dead-ripe plants contain practically none at all. Is that a fact worth remembering at haying time?

Therein is a most important argument for the silo. With labor at present prices, and Adam's ever-present curse of weeds, it is not easy to make it pay to grow roots. But silage is an admirable substitute, perhaps a more valuable food.

In fact, the silo is one of the principal answers to the chemists' demands for vitamines to perfect the ration. Something to prevent the loss of flesh and the lack of growth, all our farmers have for many years looked for. It may be that it is only now the answer to this desire is reaching the feeders of live stock, who seek to fulfill this new demand for vitamines.

Vitamines and Spring Food.

Heretofore, science has been considering these food elements as applied to human feeds. It is about time we found out just what vitamines mean to the animal world, though we know enough about them already to assure us that no ration is perfect without them properly balanced.

All animals, man as well as the lower animals, need a definite quantity of vitamines to maintain health. Young animals require much greater proportions of vitamines than do mature animals. On this basis, let us consider the question from the farmer's standpoint. He has to maintain in a healthy condition all his stock, both young and old, and in all probability vitamines play an unexpected large part in this.

All the young animals draw their vitamines—and their requirement is heavy—from their mothers in the first instance. The food supply of the suckling mother has thus to be rich in vitamines as well as in other nutriment. The milk supply of the mother is also affected by the vitamines supplied. In some cases where the vitamine supply is low, the milk supply will decrease so as to maintain its vitamine content. In such cases the young animal will starve, and perhaps die, or will, if it survives, be stunted, while the health of the mother suffers.

In other instances the milk supply will remain unchanged, but the vitamine content drops. Here the young animal suffers from lack of vitamine, in which case its growth is seriously affected, and a rickety animal will at best survive the ordeal. Usually the young animal dies, however.

An animal suckling young should have its food adjusted so that a good supply of vitamine, to meet its own and the needs of its young, may be insured. The old custom, of giving a breeding cow as much green fodder as possible, is one we now know to be wonderfully correct. It is interesting to see how, with the progress of science, many old customs based primarily on observation and experience and handed down by tradition, have been found to be correct.

Constant quibbling paralyzes action.

Not how well we have guessed, but how well we have done, should be our standard.

The farmer who relieves his hands by getting his head a little closer to his task is the hope of Canadian agriculture.

You will be more sure of hitting the bull's-eye if you keep your attention upon the target rather than upon the manner in which you are holding the gun.

Poultry

The habit of egg-eating is easy to prevent but difficult to cure when it becomes widespread in a flock. It can be prevented by feeding a balanced ration so that the hens will not strongly crave for egg-making material. Then build the nests so the hens will enter from the back. The eggs can be removed by lowering a hinged door in front. In these partially darkened nests the hens do not see the eggs easily and are less tempted to scratch in the nesting litter, a habit which often breaks eggs. If eggs are accidentally broken by the hens they are not so apt to be eaten in a darkened nest.

Sometimes one or two hens may start eating eggs and teach other members of the flock. Hens that are observed breaking eggs should be isolated or marketed. The fact that hens eat an egg ravenously when it is dropped and broken near them does not mark them as egg eaters that will break eggs for themselves.

Various ill-tasting combinations placed in eggs have been used to assist in breaking the habit. However, nothing is of much value but properly constructed nests and frequent gathering of the eggs. Overcrowding on nests sometimes causes broken eggs. It pays to have a nest for every four hens.

Hints on Handling Fruits and Vegetables.

The Dominion Horticulturist advocates the use of baskets for the local sale of apples. He points out that many farmers have varieties of apples that are difficult of sale in barrels or boxes, but that in baskets could probably be readily disposed of. Certainly retailers and consumers like to see what they are getting. Even if farmers cannot do this, owing to not going to market but shipping their produce, wholesalers could do the work themselves or could it be performed at a central packing house. By using baskets much bruising of apples would be avoided.

In "Seasonable Hints" for July, the Horticulturist emphasizes the importance of picking, handling and packing apples with the greatest care to prevent injury. Of course the same care is advisable for all fruit, but in the case of apples intended for exportation it is more than ever so. Thorough racking of the barrels to settle the apples will obviate the need to a great extent of the pressing to which bruising is often due. Another thing is that the picking should not be done by rote, that is at the same time every year, but should be governed by the weather, fruit ripening quicker in some seasons than in others. Fruit should also be deposited in a cool place immediately after picking.

Dealing with vegetables, it is advised that potatoes be left in the ground until there is danger of injury by frost; that onions be thoroughly cured before storing; that when cabbages are left in the ground and show signs of splitting, the plants be loosened by twisting them; that celery be kept growing well by continuous cultivation and, when dug, be kept crisp by storing in a cool place and keeping the roots moist; that the storage of beets, carrots, parsnips, and turnips be in as cool a place as possible but free from freezing, whereas squash requires moderate warmth. Vegetable seed should be dried and kept dry.

Birds Who Build in Trees

By Ida Belmer Camp

No bird enjoys greater popularity or receives heartier welcome in the spring than the Canadian Robin. His iniquity is tasting strawberries, cherries and other garden fruits that he does not eat. I suspect he is much like ourselves—if we had a whole world of fruit to select from, we should surely take the most delectable. So far as I am concerned, the robins are so welcome, I let them take what they want first and I take what is left.

If we would plant mulberries, choke and wild cherries in our waste places or among our cultivated fruits, the birds would be liable to let our cherries alone, as the more acid a fruit contains the better the Wing People like it.

The robins are masons, building the nest of clay, straw and strings, so plastered and interwoven and so softly lined that it is a luxurious cradle indeed in which to raise the uncouth looking little nestlings. The parent birds place this nest so nicely in the crotch of a limb or limbs that nothing but continued rain can harm it. To protect them, we can make what is known as a robin rest, nailing it high in the tree to a good stout limb. This gives them an added feeling of security. Then listen to their merry cheer-up! cheer-up! That will more than pay you for all the fruit they consume in several years.

The robin redbreast is one of our largest song birds and the ruby-throat humming bird is our very smallest, and dainty as the flowers from which it feeds.

The ruby-throats love the sweets in red and orange-colored flowers and can nearly always be found near the haunts of the jewel weed, bush honeysuckle and trumpet vine. This little gem on wings is the only one of its kind found this side of the Rockies. They always find their meat and honey together as the insects that are attracted to the flowers where the humming birds gather honey are the insects they love to eat. The temper of humming birds is all out of proportion to their size, as they will dash at an intruder who dares to come near their moss-woven nest as though they could really do him harm. The nest is built on the bough of a tree, a most beautiful creation of plant fibre and cobwebs, adorned with lichens. It resembles a little tuft of moss upon the bough. The mother lays two tiny white eggs in June. The inside of the nest is about the size of a large-sized thimble.

If we give the birds a chance to get away from the heat and inclement weather, they will take it and profit by it, rearing more and stronger hatches, which is exactly what we wish, as the gain is all ours. The more protection we give the birds the more they protect our crops, whether they be fruit, grain, vegetables or lawn.

If there are any of my readers who have not read the Song of the Cardinal by Gene Stratton-Porter, they have a treat in store. It gives one an entirely new view of bird life.

Birds have the same attributes as human beings. They love, they hate, they have their jealousies, they are fostering parents or careless ones. No one knows this better than I, who have spent all my life of sixty years in their study and care.

There are very few people who do not wish to have birds close by and they want as many different varieties as they can attract—those that nest on twigs and branches and those that mother their young among the protective leaves of shrubs and hedges. We want even the ground-nesting type and we should provide proper nesting material and nesting sites for their particular kid of nest. They go to nest where material to build with is plentiful and where there is water both for bathing and drinking.

Do not paint bird houses or rests; they like the weathered wood best. You will find woven into all wild bird nests long stranded, short stranded, coarse and soft materials. Watch the Oriole build. Examine old nests. Give the builders flax for the long stranded work, cut up horsehair for the short stranded, moss for the coarse, floss or cotton wadding for the soft—these four things are practical for every variety of twig, shrub or ground nest.

Improvement in Rural Life.

An article appears in the July-August number of The Agricultural Gazette of Canada on "Rural Life and Activities for Women" in which the writer, the Director of the Home-Makers' Department in the University of Saskatchewan, lays down thirteen activities whereby women would benefit both themselves and many others in rural communities. These all involve co-operation of women with women. They are (1) To procure proper and sanitary school equipment; (2) To establish a hot and wholesome noon school lunch, to which might be added "with milk"; (3) To have medical inspection of schools; (4) To establish rest rooms for the community; (5) To undertake the establishment of community halls; (6) To start or procure libraries for public use; (7) To procure nursing help for the district; (8) To establish and help to maintain cottage hospitals; (9) To hold fairs of different kinds; (10) To have child welfare exhibits with instruction; (11) To assist the less fortunate; (12) To co-operate and assist beneficial organizations in their work, and (13) To create an improved and healthier community spirit. The writer would plainly like to see a greater concentration of welfare work than there is at present. She believes emphatically in the encouragement of reading worth-while books and papers and in the organization of community bird clubs as a source of happiness and the development of the best qualities of humanity, also as one form of antidote to what the writer aptly terms "commercialized forms of amusement," which are becoming more and more common all over the country. Home and localized opportunities for healthy recreation in the few spare hours are a necessity for every rural community.

Fence row crops can be easily marketed on the sheep's back.

THE SUNDAY SCHOOL LESSON

AUGUST 13

Esther Saves Her People, Esther 4: 10 to 5:3. Golden Text —The righteous cried, and the Lord heard, and delivered them out of their troubles.—Ps. 34:17 (Rev. Ver.)

Lesson Foreword—In preparation for the lesson, the whole Book of Esther should be read. One scholar epitomizes it thus: Esther is the story of a beautiful Jewess of Susa whom Xerxes (Ahaserus) raises from his concubines to be his queen, and who uses her influence over him to save her people from a general massacre which the grand vizier (Haman) has prepared for them by way of avenging an affront from one of the race. The story of Esther has ever been popular with the Jews for it magnifies the importance of the Jewish people, and breathes throughout the traditional pride of their race. It also explains the origin of the feast of Purim, basing it on a signal national triumph. (See ch. 9 and especially vs. 26, 31, 32.)

I. An Urgent Request, 4: 10-17.

Haman, piqued at Mordecai's lack of civility to him persuades the king to issue a decree permitting the slaughter of the Jews. (See ch. 3: 1-15.) The Jews are filled with consternation and Mordecai sits by the palace gate clothed in sackcloth and ashes. When Esther sends out other clothes to him, he refuses to put them on but urges Esther to go to the king and beg that the decree be reversed. Ch. 4: 1-9.

V. 10. **Hatach**; one of the eunuchs of Ahaserus' court and probably a personal attendant upon Esther, the queen. He must have been a trustworthy man to carry such confidential messages between Esther and Mordecai.

V. 11. In order to preserve the dignity of the king and to prevent him from assassination, it was a law of the Persians that no one could approach the king without being summoned. Not even the queen could appear before the king except by summons. It was now thirty days since Ahasuerus had sent for Esther. It would, therefore, be dangerous for Esther to venture, unbidden, into the king's private chambers.

V. 13. **Think not that thou shalt escape.** Esther was, of course, a Jewess, a relative of the hated Mordecai; but this was not known at the court. Yet when and if it were finally known, she would perish in the general massacre of her people. So it was just as dangerous for her to remain away as to go in to the king.

V. 14. **Enlargement and deliverance to the Jews from another place.** The Book of Esther nowhere mentions the name of God; this is an instance of how the mention of it is avoided. "Another place" clearly refers to God. If Esther will not plead before the king for her people, then God himself, remembering his ancient promise to Israel will deliver them. **But thou and thy father's house**, etc. If Esther refuses to intercede on behalf of the Jews, she will be visited with a special judgment which will involve all of her family. Eventually the other Jews may escape the decreed massacre, but Esther and her family will not so escape. **Who knoweth**, etc. Remember that Mordecai is urging Esther to appear before the king for Israel's sake. He has urged other pleas, but now he plaeds on very high and unselfish grounds.

V. 16. A very deep chord among Esther's heart-strings has been touched and now vibrates with noble response. She resolved with calm determination and with her eyes opened clearly upon the grave dangers, to enter, unsummoned, the inner chamber of the king. She requested that all the Jews in Susa should lend her their spiritual support. They were to fast for three days; this general abasement would be accompanied, no doubt, with prayers for the success of her mission.

II. Esther Finds Favor, 5: 1-3.

V. 1. **Esther put on**, etc. The queen arrayed herself in her finest garments so as to enhance her beauty and charms in the eyes of the king. **The inner court of the king's house.** In 1884-6 Dieulafoy excavated the ruins of the palace of Artaxerxes in Susa. He describes the palace as standing in the midst of a garden or "paradise," surrounded with a fortified wall. In one section of the royal residence was the harem, or "house of the women"; in another section was the throne-room, surrounded with an open space that may have been used as a garden.

V. 2. **The king held out . . the golden sceptre.** The golden sceptre appears in the monuments as "a long tapering rod with a headlike ornament at one end and a loop at the other." Josephus says: "The king sat with a golden sceptre in his hand; and when he wished to save any one who came uncalled, he held it out to him; and he that touched it was safe."

V. 3. **Even . . to the half of the kingdom.** See Mark 6: 23. This has been described as "the exaggeration born of Oriental politeness." It was not meant to be taken too literally, any more than the offer of a merchant in an Eastern bazaar who says to the prospective purchaser, "O take it for nothing."

Application.

The Sin of Silence. It is sadly true; it is as prophetic and faithful a word to us in our circumstances and time as to queen Esther. "If thou altogether holdest thy peace at this time," some one else will speak the brave, timely word, which brings deliverance, and thy abject coward spirit will shrink, and wither and "perish." Of course, there are times when silence is golden—it may be kindly, and the result of self-restraint and calm strength. And every man knows in his heart whether duty commands silence or speech.

Consider the importance of the present, of to-day, in the matter of personal relation to God. The Scriptures certainly stress this. "Wherefore (as the Holy Ghost saith, To-day if ye will hear his voice, Harden not your hearts . . Exhort one another daily, while it is called To-day; lest any of you be hardened through the deceitfulness of sin," Heb. 3: 7, 13. "He saith, I have heard thee in a time accepted, and in the day of salvation have I succoured thee: behold, now is the accepted time; behold, now is the day of salvation," 2 Cor. 6: 2.

There are considerations that may be presented to the minds of a class of young people, emphasizing this—if ever this matter is decided it will be on some "to-day"; it is wise then that it be this day; all experience shows that the early teens is a more hopeful time for religious choice than a later time; it is God's will, it is duty, that it be now, if the decision has not been made before.

THE CHILDREN'S HOUR

If You Are Well-Bred.

You will be kind.

You will not use slang.

You will try to make others happy.

You will never indulge in ill-natured gossip.

You will never forget the respect due to age. You will not swagger or boast of your achievements.

You will think of others before you think of yourself.

You will not measure your civility by people's bank accounts.

You will be scrupulous in your regard for the rights of others.

You will not forget engagements, promises, or obligations of any kind.

You will never make fun of the peculiarities of others.

You will never in any circumstances cause pain to another, if you can help it.

You will not think good intentions compensate for rude or gruff manners.

You will be as agreeable to your social inferiors as to your equals and superiors.

You will not gulp your soup so audibly that you can be heard across the room, nor sop up the sauce in your plate with bits of bread.

You will not have two sets of manners; one for company, and one for home use.

You will never remind a cripple of his deformity, or probe the sore spots of a sensitive soul.

You will not attract attention by either your loud talk or laughter, or show your egotism by trying to monopolize conversation.

One way to make farming a better business is to eliminate waste labor, equipment and capital.

In the long run the chief aim of human laws is to protect the rights of the minority.

We should complain less of, and respect more, our daily task, since it is our greatest schoolmaster.