Address communications to Agronomist, 73 Adelaide St. West, Toronto

How I Remodeled My Old Poultry House.

When I bought my farm in Southern Ontario it contained only one poultry house of the semi-monitor type. It was built of matched lumber on a stone foundation, and had an open front.

We could find no serious fault with the outside of the house. But the interior was not modern. It was not arranged for the satisfactory management of poultry. The roosts were nailed to the walls of the house. This furnished an ideal breeding place for mites, and when the roosts were pried out we found plenty of them. They hung in clusters beneath the roosts. We painted the old roosting poles with kerosene, then added the roosts to the kindling-wood pile, to make destruction doubly sure.

The house contained no dropping boards, which made the condition of the floor bad, and reduced the scratching area. So we built a dropping platform of smooth lumber along the back wall of the house. Roosts were made by planing the upper edges of two-by-three pieces until they were rounded and smooth. These roosts were then nailed in sections of three roosts each, and each section was hinged to the back wall of the house. A hook placed in the middle of each section permitted the roosts to be raised easily, and hooked to the ceiling when the dropping boards were cleaned. It also made it easier to dust or spray the roosts on the under side, where red mites are not likely to appear.

The nests were boxes tightly nailed to the wall. Now, I have found by experience that nests must be loose, so they can be taken outside the house for emptying, followed by sunning and spraying. Nests that are tightly fastened to the wall form breeding places for mites and lice.

I find also that open nests may lead to the egg-eating habit. In winter the birds may scratch in the litter of the nests after eggs have been laid. Eggs kicked against the side of the nest are apt to be broken and then eaten. Open nests also become unclean from the hens roosting upon them at night, or sitting on the edge during the day. In remodeling my house I built the nests in portable sections. If the top of a section slopes sufficiently, the birds will not roost upon it. If the top does not have enough slope it pays to stretch a strip of poultry wire above the nests in such a manner that the hens cannot roost there.

Poultry nests must be so built that the eggs will be clean. An egg that is washed loses the film provided by nature to help keep it fresh. Dirty eggs look very bad, and the producer with a select trade cannot include them in filling orders. If the nests are slightly darkened and the nesting litter kept clean, the eggs will be clean with the chalky freshness which customers expect when they pay a premium for fresh eggs.

I find that a small wooden table is useful in a poultry house. It should hold the water pail and a crock or two of sour milk. Then litter cannot be scratched into the water and milk, making them a possible source of disease.

If there is no time to build hoppers, the grit and oyster shells can be placed in earthen crocks on this low platform. I find that hoppers are best, however, as they hold a larger supply and need filling less often. Hoppers for dry mash can easily be made of small packing boxes. Sketch the outline of the proposed hopper on the sides of the box. Then saw out the box to conform with the sketch, and use the material removed to board up the front of the hopper. Make a sort of lip in front so that the hens cannot waste it on the floor.

In remodeling my house I found that the curtains were hinged to the top of the windows so they could be pulled back and hooked to the ceiling. I also found that the hens had been roosting on the curtain frames, making them dirty and infesting them with mites. I took these curtains out and burned them. The new curtains are of the roll type. They are seldom used except during the two or three severe storms that come from the south every winter. Very heavy storms from other directions do not cause the snow to blow into the house and consequently the curtains do not have to be lowered.

I find that there are many poultry houses which do not give good service because of faulty equipment. The actual needs are so small in that respect that it pays to build the necessary portable equipment. Then reap the steady reward for your work, which is bound to come if you have a laying strain of hens and feed them properly.

Tip Burn of Potatoes.

A trouble which is widely distributed and very prevalent in some seasons, and to which the name "Tip Burn" has been given, is to be found among our potato crops. This trouble takes the form of a gradual burning and drying-up of the leaves of the plants, often commencing at a comparatively early stage in their growth and, in many cases, if allowed to go unchecked, slowly but surely involving the whole of the plants so that they die down a considerable time before the tubers are fully developed.

The appearance of this trouble in the fields is often mistaken by growers for Late Blight. There is, however, a marked distinction between the two, for Late Blight may commence by attacking any part of the plants—leaves and stems alike—has a dark, water-soaked appearance and, in its early stages, is damp to the touch, while Tip Burn invariably commences at the margin or tips of the leaves and has a decidedly dry appearance and touch with the exception of after rain. It also appears much earlier in the season than Late Blight has ever been recorded and does not cause the death of the plants so rapidly. Nor has it ever proven so destructive as Late Blight, although evidence has been obtained that in seasons when it is severe and where no effort is made to check, a considerable reduction in the yield of marketable tubers, due to the premature death of the plants from this cause, may result.

Investigators of this trouble are not yet in agreement as to the cause. The observations of some have led to the belief that a period of hot, dry weather during the growing season causes the leaves to throw off moisture more rapidly than it can be furnished by the plant, the result being the appearance of Tip Burn. This theory seems, however, to be disputed by the fact that the trouble is not found in the hot regions of the Western States where the temperature often becomes excessive and the air is especially dry.

More recent investigations lead to the belief that this burning of the leaves probably follows the depredations of sucking insects. These investigations are not yet complete, but enough evidence has been produced to serve as a warning to potato growers to keep these insect pests thoroughly under control in an endeavor to avoid Tip Burn.

We have found in our experimental work with potatoes that Bordeaux mixture will to a large extent control this trouble. In 1918, when it was extremely prevalent, we had several plots to which, for the purposes of experiment, Bordeaux mixture was not applied. These plots suffered from a severe attack of Tip Burn and the plants were all killed down by the second week in August, while other plots on the same land, and to which, for the control of Late Blight, Bordeaux mixture was regularly and thoroughly applied, suffered to a very slight extent only, the plants remaining green until frost came. Bordeaux mixture acts as a repellent to the Leaf Hopper, as well as a protection to the plants. Many other cases, in addition to that referred to, have come to our attention, bearing evidence that regular and thorough spraying with this mixture will reduce to a minimum the ravages of Tip Burn.

Improved Seed.

The Dominion Department of Agriculture, through the Seed Branch, works in active co-operation with the provinces in the matter of improving grain and field seeds. Money is provided to pay prizes in standing field crop competitions, at seed fairs and provincial seeds exhibitions, and in combined seed crop and cleaned seed competitions. The last named is a recent introduction. It has two distinct phases, the first consisting of a standing field crop competition and the second of threshed and cleaned seed in which the seed produced from the fields of the first phase is judged in the granary of the competitor. The competitions must have at least fifteen entries in each, and the foundation seed used must be of approved origin. The minimum quantities of cleaned seed that competitors must be prepared to submit to qualify for awards are: wheat, barley, peas, buckwheat and corn each 100 bushels, oats 200 bushels, field beans 25 bushels, clovers and timothy 15 bushels, and potatoes 150 bushels. The awards, except in the case of potatoes, are made on a basis of 65 per cent. on the bin score and 35 per cent. on the field score. In the case of potatoes the method is reversed, the award being based on 35 per cent. on the bin score and 65 per cent. on the field score. All agricultural associations are eligible to conduct these competitions, provided the association entering does not conduct a field crop competition in the same season with the same kind of crop. To the prize money under subvention agreement the Dominion subscribes $200 in each instance and the province $100.

North America has a white population of 100,000,000.

Tub Hats for the Kiddies.

Simply adorable are the little summer hats for the kiddies made of white pique. What child would not love one especially if it were decorated on the upper brim with a row of tiny quacking ducks or chirping chickens? This is a splendid way for Mother to use up the odd pieces of white pique or rep. The hats are simple to make. They fit the head well and are decidedly practical.

To make the brim cut two circular pieces of pique, each 12 inches in diameter. In the centre of each of these circles cut another circle 6 inches in diameter. The inner circle may vary according to the child's head-size. (It will be best to cut paper patterns first.)

Turn the right sides of the brim together and baste and stitch the outer edges taking a ¼-inch seam. Turn the brim, baste the outer edge, and stitch again on the edge.

The crown is made from a circular piece of pique, 10 inches in diameter. Face the crown and fasten to the brim with tiny buttons and buttonholes.

The quacking ducks around the upper front edge of the brim are embroidered in outline stitch. Six-strand embroidery cotton in Copenhagen blue is used for the ducks and yellow floss for the bills and eyes. Brim is embroidered before it is attached to the crown.

There are two ways of getting a better cow. One is to put one's hand into his pocket—deep, in these days—and pay for her; the other is to grow her. The last way is the best, the first the quickest. Raise a cow and you understand her and she knows you. You make a better team, and team work in the dairy is what counts.

Better Lawns Make Better Homes

There are many mistakes made in the establishment of lawns and in their subsequent management. In order to make a good lawn the soil must be fairly fertile or it is necessary that it be made so by proper fertilization. The regular use of suitable fertilizers is also necessary.

Tht best time to insure a good soil for a lawn is at the time when the excavating and the grading are done. Frequently a good site that is naturally fertile is made unproductive or undesirable by covering it over with sub-soil taken from another location, that is, from basements or sections that are moved in grading. Not infrequently building rubbish, ashes, cinders, cans and other debris are covered with a thin layer of soil, the result being a very unsatisfactory production of desirable grasses. A very good rule to follow is, keep at least six inches of rich soil on the surface. This six inches or more of soil should be fine in texture or a loam or clay loam material, inasmuch as they are the best for the production of most all grasses that are grown on lawns. They dry out less quickly and retain added fertilizers to much better advantage than do the sandy soils.

Where drainage conditions are not good they should be corrected by the laying of tile at proper depths with suitable outlets. If the subsoil is very heavy or impervious the surface soil is likely to hold too much water or become waterlogged, resulting in unsanitary conditions, and usually an unsatisfactory growth of grasses.

If, on the other hand, the sub-soil is very porous or sandy, the lawn must be watered very frequently and fertilized more often than if it is heavy in texture. In the establishment of a lawn, if it is available, a generous application of well-decayed or rotted stable manure is desirable. This should be worked well into the soil, the application consisting of about four hundred to eight hundred pounds per square rod. The use of well-rotted manure is advantageous because there is much less danger of the introduction of undesirable weed seeds, some of which may prove objectionable later on.

After the manure has been applied either hydrated lime at the rate of about fifteen pounds per square rod or air-slaked lime, or finely pulverized limestone at the rate of about twenty pounds per square rod or dried marl at the rate of about twenty-five pounds per square rod should be added to the soil, and worked into it when the land is prepared for seeding. In addition it is advisable to apply four pounds of sixteen per cent. acid phosphate per square rod.

When the seed-bed has been extremely finely pulverized and leveled down the seeding may be made. As a general rule the Kentucky bluegrass makes the most popular and most successful grass, forming an excellent turf. Some seed a mixture of grasses, however, such as the bluegrass and the English or Italian rye grass. Where three parts of the bluegrass and one part of the English rye grass is used in the mixture, about half a pound is usually seeded on a square rod. A mixture of bluegrass and white clover is also a very popular one. Precautions should be taken in all cases to obtain grasses whose percentages of germination are high. In some instances mixtures of low percentages are placed on the market.

Following the establishment of the lawn for best results it should be carefully handled and not neglected. A very good rule to follow is to never permit the lawn grass to go to seed, inasmuch as this tends to cause it to deteriorate, and result in a poor or unsatisfactory lawn. A point that is frequently overlooked is that the new land should be permitted to pass into the winter with a considerable growth; in other words, it should not be mowed very closely in the fall. This is done in order to protect the young grass roots during the winter.

Many of the most successful lawns are rolled. Especially is this desirable in the case of a new lawn. This is done to compact the soil and cause the grass roots to take a firm hold. Frequently the grass roots are loosened by the freezing and thawing during the winter season and rolling is necessary to overcome this condition. In other instances angle worms leave the lawn in a roughened condition and the rolling overcomes this.

Mistakes are sometimes made in watering lawns. It is better to thoroughly soak the soil by laying the hose on the ground and permitting the water to flow freely on one part for an hour or so and then move it to another place. The sprinkling method is satisfactory if continued long enough, but frequently this is not done. The soil dries out with the exception of the very shallow layer at the surface.

Only surface applications of fertilizers to establish lawns are made. Where stable manure is used it should be applied very early in the spring. In some instances mistakes are made by applying fresh manure in too large quantities, there being too much soluble material added for the grass, the result being either the killing out of the grass, commonly spoken of as burning out, or a decided setback to it. If fresh manure only is available it should be applied very uniformly over the surface at the rate of one hundred and twenty-five pounds per square rod. As previously stated, however, the rotted manure is better on account of less danger of the introduction of some of the troublesome weeds. The manure should be carefully removed from the lawn shortly after the grass begins to grow in the spring. Where the manure is not made use of top-dressings of nitrate of soda at the time growth begins may be used at the rate of from one-quarter to one pound per square rod. Precaution should be taken to spread it uniformly over the surface and when the grass is not moist, or when the dew is not on it; otherwise, the leaves of the grases may be burned or injured by the nitrate. Subsequent applications of similar quantities may be made as the lawn demands it. In some instances the nitrate of soda is dissolved in water and sprinkled on the lawn; usually, however, this is not necessary.

Ammonium sulphate should not be applied to lawns that are growing bluegrass or white clover inasmuch as it will cause them to disappear and other less desirable ones may come in. It should not be overlooked, however, that if the soil is limed about every four years, topdressings of ammonium sulphate without lime drives out the injurious effect to these plants. Investigations on the use of ammonium sulphate and sodium nitrate on lawns over a period of twenty years or more show conclusively that the use of ammonium sulphate without lime drives out the bluegrass and clover, as well as several other grasses, and also a number of troublesome weeds that may come into the lawn. If one is desirous of growing such grasses as the red-top, bent grasses and some of the fescues, the ammonium sulphate should be used and the soil left acid.

Acid phosphate should be applied to the lawn about every two years at the rate of three hundred pounds per acre, although finely ground limestone as a carrier of phosphorus may be used about twice at the rate of five pounds per square rod.

Grow Perennials.

July is an ideal time to sow the seeds of such hardy plants as pinks, columbines, perennial larkspurs, foxgloves, pansies, sweet-williams, Shasta daisies, and many others. These will make a nice growth in the fall seed bed, and will bloom at the regular time next spring. The clumps will not be quite so large as those from seeds sown in May, but the May-sown plants will not bloom the first year, so there is not much gained by planting them. You can plant the fall-sown plants somewhat thicker, and in transplanting have more chance to cut out inferior plants.

Most of these plants like a loose mellow loam that will not pack or run. Woods soil with plenty of leaf mold is ideal. Sow the seeds in rows. Do not crowd the rows. The seeds should be covered not over a quarter to half an inch, and kept moist until up, which will take ten days or two weeks for most of the common varieties. Some are slower to germinate and older seeds are slower than fresh ones. Thin the plants in the rows if too thick, but a half-inch space will serve until transplanting time, except for such strong growers as hollyhocks.

The seed bed should be well cultivated to give the little plants a chance to make a good growth. As cold weather draws near, let them get pretty dry to harden them up. Water the bed well before giving protection, if it is not already moist. This mulch can be any coarse material, but tree leaves are probably best. Straw free from fine chaff will serve, or coarse hay. Anything that will pack will shut off too much air. A good water-tight roof should be placed over all. The bed should be high enough to secure good drainage. With the packing kept dry, there is little danger of winter-killing. I have kept them by turning an empty box over them, making the bottom of the box tight so it would shed the water.

A little care will make your plants thrive, and they will reward you with abundant bloom next spring and summer.

THE SUNDAY SCHOOL

JULY 3.

The Early Life of Saul. Acts 21: 39; 22: 3, 28; 2 Tim. 3: 14, 15; Duet. 6: 4-9. Golden Text—Hebrews 3: 7, 8.

Connecting Links—For the Sunday-school teacher and Bible class student the best helps for the study of the life and work of the great apostle will be found in the available commentaries on the Acts and Epistles. I would recommend also the following: Bosworth's Studies in the Acts and Epistles (arranged for daily reading), Patterson Smyth's Life and Letters of St. Paul, Stalker's life of Paul, R. D. Shaw's The Pauline Epistles, Ramsay's St. Paul the Traveller and Roman Citizen, and Lake's The Earlier Epistles of Paul.

Next to our Lord Himself the greatest and most outstanding figure of the New Testament is that of Paul. A thorough-going Jew, of a strict Jewish family, an ardent patriot, a lover of his people and of their ancient faith, a man of quick impulses, zealous for the cause which he had at heart, indomitably persevering, and yet with a deeply affectionate and generous nature, he attracts and holds our attention from the first. The first three lessons of our present series show him to us as the Jew and Pharisee, the lessons that follow, as the Christian preacher and teacher, traveller and missionary.

It was Paul who first saw clearly the significance of the gospel message for the whole world, and not for the Jews and Jewish proselytes only. It was he who conceived the noble ambition to be an apostle to the Gentiles, called of God to that great task. From the narrowest of Jewish circles he stepped forth as the leader of a great international movement of brotherhood and good will. His ambition was truly imperial, being nothing less than to win the empire of the world for his crucified Master, to break down race barriers, and to build a temple of humanity, in the midst of which God, by His spirit, would dwell. Christianity might have become the religion of a Jewish sect; Paul made it what Jesus had declared it would be, a world-conquering force.

Acts 21: 39. **A Jew of Tarsus.** We are fortunate in having, both in Luke's history in the book of Acts, and in several of the Epistles, definite statements about Paul's earlier life. Here Luke tells us (chaps. 21 and 22) of Paul's return to Jerusalem after his third great missionary journey, and of the riot which was stirred up against him by bigoted and narrow-minded Jews, who hated him for his preaching a gospel of salvation to other nations, and for declaring that the Gentiles would share with the Jews the future glory of the Kingdom of God. Paul was rescued from the mob by the captain of the Roman troops which held the castle, or citadel, of Jerusalem, and was afterward permitted by him to address the crowd from the castle stairs. To the captain's inquiry as to who and what he was he made the answer of this verse.

Tarsus, the city of his birth, was the chief city of the province of Cilicia, in Asia Minor. Paul's family must have belonged to a colony of Jews which had settled there, and he held by inheritance the rights and privileges of a free citizen of the Roman empire. He must have been familiar with the Greek language from his childhood. In the schools and in the university he must have become acquainted with Greek and Roman literature, and with the philosophy and poetry both of the east and the west. The university of Tarsus rivalled, indeed, the two other great seats of learning of that age, Athens and Alexandria, and was reckoned superior to them in love of learning by Strabo, a well-known ancient writer. Tarsus received students from all parts of the world, and sent teachers abroad to many lands. From Tarsus Paul went to continue his studies in Jerusalem under the great Jewish scholar, Gamaliel, and so became an accomplished scholar both in Greek and Hebrew.

Acts 22: 3. **According to the perfect manner of the law of the fathers.** Of the Jewish scholars and teachers Gamaliel was one of the greatest. He was grandson of Hillel, founder of one of the two Ribbinical schools which had an extraordinary influence over the minds of the people in the time of Christ. That he was also a man of tolerant and liberal views appears from the story told of him in Acts 5: 34-40. Under his teaching Paul studied the books which now form our Old Testament, and in particular the ancient laws, which the Jewish doctors had sought to adapt to the needs of their own time in what has come to be known as the Mishua, the central and oldest part of the Talmud. From this school of Gamaliel Paul (or Saul, as he was then called) was taken to become an officer of the supreme council of the Jews, the Sanhedrin.

22: 28. **Free born.** Paul's father must, therefore, have also been a Roman citizen. The Romans were masters of all the lands about the Mediterranean Sea, and of large parts of Europe and western Asia and northern Africa. The privileges enjoyed by those who had the rights of citizenship were very great, and Paul found afterward in his travels, when in difficult and dangerous places, that he could rely upon protection from Roman officers and magistrates. His Greek learning gave him approach to the people of many lands, and his Roman citizenship gave him protection in his great missionary work.

2 Timothy 3: 14-15. **From a child.** It was near the end of Paul's life, and while in a Roman prison that he wrote this letter to his younger and dearly beloved friend Timothy. Timothy, like Paul, had been born and brought up in Asia Minor. His home was in Lystra (Acts 16: 1), his mother was a Jewess, his father a Greek. His childhood, no doubt, had been like that of Paul, and by a good mother he had been carefully taught in the holy scriptures. The Old Testament stories, poetry, and prophecy were familiar to him, and Paul urges him to continue in those things which he had thus learned, and which were able to make wise unto salvation, not in themselves, but through the faith of Christ. What Paul says here about his friend may very well reflect the lessons of his own childhood, and we do not need to doubt the genuine and sincere piety of those simple Jewish homes, which was fed upon the sublime and pure teachings of the Old Testament.

Deut. 6: 4-9. **Thou shalt teach them.** In the time of Christ and ever since, in devout Jewish homes, a sincere effort has been made to keep this command. These words are repeated morning and evening. The law and the prophets and the psalms are diligently read. It would be strange indeed if the Jews did not thus learn much that is good, and as a matter of fact there has been developed in many hearts and homes a real faith in God, and a sincere desire to do good. We, who have received the inestimable gift of the knowledge of Christ, should seek to know and to understand better the people from whose homes came both Jesus and Paul.

Application.

There may be men who, as we are sometimes told, are beyond church influence, but there are few with whom the church has not had its opportunity. Abel the worshipper and Cain the murderer; Moses the man of God and Pharaoh the oppressor; Elijah the prophet and Ahab the idolater; Miriam the prophetess and Jezebell the serpent; Nero the incarnate demon and Paul the apostle; Wesley the evangelist and Voltaire the mocker; Chalmers the savior and Napoleon the destroyer—all these men were children once. In their cradles there slumbered the energy which afterwards went forth for blasting or for blessing the world.

Why Cool Air is Bracing.

Every one knows the bracing effect of a walk on a windy day. Now the secret of this feeling of vigor has been explained in a report issued by the Industrial Fatigue Research Board, which has been making experiments in factories throughout England, says a London despatch.

It is pointed out that a cool skin encourages exercise, stimulates deeper breathing, increases circulation and aids digestion. The physical properties of air benefit the body, and when one battles with a sharp autumn wind it is the "air bath" that gives the feeling of vigor with which all are familiar.

Factory owners and theatre and moving picture proprietors are advised that for the most beneficial results their rooms should be cool, rather than hot; dry, rather than damp, with a diversity in temperature and a brisk air movement.

The committee also states that the color of clothing worn has a marked effect on body temperature, darker clothing being warmer, irrespective of material.

WOOL

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