Conducted by Professor Henry G. Bell.

The object of this department is to place at the service of our farm readers the advice of an acknowledged authority on all subjects pertaining to soils and crops.

Address all questions to Professor Henry G. Bell, in care of The Wilson Publishing Company, Limited, Toronto, and answers will appear in this column in the order in which they are received. As space is limited it is advisable where immediate reply is necessary that a stamped and addressed envelope be enclosed with the question, when the answer will be mailed direct.

Henry G. Bell.

Question—M. P.:—I have purchased two tons of ground limestone to experiment with. How, when and where shall I apply it to get best results? I intend to sow oats, barley, corn, sugar-beets, clover and wheat. The land is all under-drained and fall plowed except corn stubble and beet ground; soil, good clay loam. Intend to sow barley on corn stubble land disced up in the spring and seed to red clover.

Answer:—I would advise you to pick out three acres of uniform corn stubble land. Apply one ton of ground limestone to the first acre and thoroughly disc it in, in preparing the seed-bed for the barley which is to be seeded to red clover. On the second acre which should lies right between one and three thoroughly disc the land but do not apply limestone and seed to barley and red clover. On acre No. 3, apply the remaining 1000 lbs of ground limestone and disc up the land in preparation for the grain seed. Just before seeding time, or a week or ten days after having worked the limestone into the soil, apply 200 to 300 pounds of a fertilizer analyzing 2 to 3% ammonia and 8 to 10% available phosphoric acid. If your seed-drill has not a fertilizer drilling attachment, scatter the fertilizer as evenly as possible over the acre and thoroughly harrow it into the ground. Then sow your barley and red clover as before.

At harvest time weigh the results from the three individual acres separately and you will have a clear demonstration of,—first, the value of the lime, second, the value of the lime and fertilizer. Besides weighing the barley, be sure to note the earliness with which it ripens on each plot and the weight per bushel of the grain when it is harvested. Also note how successful the grass and clover seedings have been on each plot.

Ground limestone is a corrector of soil sourness and is not essentially a plantfood. When you have limed the soil you have corrected its condition so that clover will thrive on it, but when you have added 200 to 300 pounds of fertilizer in addition to the lime, you have given available plant-food to the tiny clover crop just the same as you give whole milk to the young calves, and the results from seeding both the young barley and clover crops should be quite as apparent as they are in good feeding of live-stock.

Question—S. C.:—Am thinking of sowing a couple of acres of beans. How would they do on sod plowed in the spring? The land is sandy loam which has not been worked for quite a while. Would sow the beans with a ten hoe drill. How deep should they be planted and would the common white bean be all right?

Answer:—Beans should do well upon spring plowed sod, if after plowing great care is taken to thoroughly disc and harrow the seed-bed, and possibly if the ground appears to be too loose to roll it and follow with a harrowing. The point is that the turning under of the heavy sod may make the seed-bed too loose and actually injure the water supply around the growing plant. This can be avoided by thoroughly working the seed-bed into a compact but still mellow form.

The general rule, in sowing seed, is to put them not deeper than four times their longest diameter. This would mean that the beans should not be planted deeper than 2½ to 3 inches. The common white bean is a serviceable type to grow but you should take care to sift out all the undersized and injured beans and to pick out 100 beans and lay them between a damp cloth, keeping them in a warm room. You can watch the sprouting of these beans after they have been prepared as described, and if at the end of a week or ten days they do not sprout strong and show considerable vigor, you will do well to obtain new seed.

COMING BACK TO DEVASTATED HOMES.

This picture shows graphically what faces the Belgian refugees when the Germans have swept over their towns. This aged couple after wandering homeless and penniless for months have returned to pick up the shreds of their lives. Where there was a prosperous town they find only ruin and desolation.

What is left for them to do? It seems hopeless, yet thousands of them have faced their reconstruction period long before it was safe to do so, with the same fortitude that the Belgian nation displayed in resisting the invasion.

But these courageous people must have help, until they can get on their feet again and find means to keep themselves alive, they must receive aid from their friends abroad. At least food must be supplied them.

This is the work the Belgian Relief Committee undertook to do and has done with a thoroughness that has astonished the world. It has tirelessly labored to give these people the chance they have so well earned to re-establish themselves.

In this work it has been aided by the people of Canada most freely, and it is dependent on Canadians still, with their brothers in Great Britain and the United States, to continue the work as long as the Germans remain on Belgian soil. Subscriptions should be sent either to the Central Belgian Relief Committee at 59 St. Peter Street, Montreal, or to the local branches.

ESSENTIALS FOR THE GARDENER

Construction and Care of Hotbed and Cold Frame—Both Are of Greatest Assistance in Obtaining An Early Start With Market Produce.

The gardener's greatest aids in raising early crops are the hotbed and the cold frame. The hotbed enables him to plant seed and produce seedlings long before the seed planted out of doors has begun to germinate. The cold frame enables him to get the seedlings produced in the hothouse gradually accustomed to outdoor conditions and to raise these into strong, sturdy planting stock by the time the garden is ready for them.

The cold frame is used in hardening the plants which have been started in the hotbed or in mild climates for starting plants before the seeds can be safely planted in the open.

Resetting plants from a hotbed into the cold frame gives them a better root system and makes them stockier and more valuable for transplanting in the open ground.

Building of Hotbed.

The hotbed should be in some sheltered, but not shaded, spot which has a southern exposure. The most convenient size is a boxlike structure six feet wide and any multiple of three feet long, so that standard three by six feet hotbed sash may be used. The frame should be twelve inches high in the back and eight inches on the front. This slope is for the purpose of securing a better angle for the sun's rays and should be faced toward the south.

The hotbed not only must collect any heat it can from the sun, but also must generate heat of its own from fermentation in fresh manure. Fresh horse manure, free from stable litter, is best for generating heat.

If the hotbed is to be an annual affair, make an excavation eighteen inches to two feet deep, about two feet greater in length and width than the frame carrying the sash. Line the excavation with plank or with a brick or concrete wall. A drain to carry off surplus water is essential. After a sufficient amount of fresh horse manure has been accumulated, fill the pit, and while it is being filled tramp the manure as firmly and as evenly as possible. When the ground level is reached place the frame in position and bank the sides and ends with manure. Place about three inches of good garden loam on top of the manure inside the frame and cover it with the sash. After the heat has reached its maximum and has subsided to between 80 degrees and 90 degrees F., it will be safe to plant the seeds. Select the plumpest, freshest seeds obtainable. Use standard varieties and get them from reliable seed houses.

Crisis in Plant Life.

Keep the bed partly dark until the seeds germinate.

After germination, however, the plants will need all the light possible, exclusive of the direct rays of the sun, to keep them growing rapidly. This is a crisis in plant life and ventilating and watering with great care are of prime importance. Too close planting and too much heat and water cause the plants to become spindling. Water the plants on clear days in the morning and ventilate immediately to dry the foliage and to prevent mildew.

The cold frame, so useful in hardening plants started in the hotbed and for starting plants in mild climates, is constructed in much the same way as the hotbed except that no manure is used, and the frame may be covered either with glass sash or with canvas. A cold frame may be built on the surface of the ground, but a more permanent structure suitable for holding plants over winter will require a pit eighteen to twenty-four inches deep. The cold frame should be filled with a good potting soil. The plants should have more ventilation in the cold frame, but should not receive so much water. It is best to keep the soil rather dry.

In transplanting, remember that plants usually thrive better if transplanted into ground freshly cultivated. Transplanting to the open field is best done in cool, cloudy weather, and in the afternoon. This prevents the sun's rays from causing the plant to lose too much moisture through evaporation. In transplanting the gardener will find a child's express wagon an excellent trolley tray for bedding out his seedlings.

Mothers and daughters of all ages are cordially invited to write to this department. Initials only will be published with each question and its answer as a means of identification, but full name and address must be given in each letter. Write on one side of paper only. Answers will be mailed direct if stamped and addressed envelope is enclosed.

Address all correspondence for this department to Mrs. Helen Law, 75 Castle Frank Road, Toronto.

H.B.M.:—1. For your boys of eight, eleven and fifteen years of age, the following books are recommended: "Lorna Doone," by Blackmore; "Story of Great Inventions," by E. E. Burns; "Legends of King Arthur and His Court," by F. N. Greene; "Old Greek Stories," by Jas. Baldwin; "Adrift on an Ice-pan," by Dr. W. T. Grenfel; "David Livingstone," by C. S. Horne; "The Boy's Nelson," by H. F. D. Wheeler; "Lives of Poor Boys Who Became Famous," by S. K. Bolton; "Historic Boyhoods," by R. S. Holland; "Heroes and Heroines of English History," by A. S. Hoffman; "Plutarch's Lives for Boys and Girls," retold by W. H. Weston; "Ivanhoe," and "Kenilworth," by Sir Walter Scott; "Tom Brown's Schooldays," by Thos. Hughes; "John Halifax, Gentleman," by Miss Mulock. There is also a splendid series of twenty volumes, for boys and girls from eight to fourteen, of which a few titles are: "Birds That Every Child Should Know," "Earth and Sky That Every Child Should Know," "Water Wonders That Every Child Should Know." Some of the other subjects treated are: "Wild Animals," "Pictures," "Songs," "Trees," "Famous Stories," "Heroes," "Heroines." This series affords a vast amount of useful information in very readable form.

L.W.:—The wedding anniversaries are as follows: 1, Cotton; 2, Paper; 3, Leather; 4, Fruits and Flowers; 5, Wooden, 10, Tin; 12, Silk and Fine Linen; 15, Crystal; 20, China; 25, Silver; 30, Pearl; 40, Ruby; 50, Golden; 75, Diamond.

mond.

H.L.R.:—1. Milk dishes are the most valuable bone-forming foods. 2. It is said that a very hot nail will not split plaster when it is driven into it. 3. The best way to soften butter is to invert over the plate of butter a bowl which has been first heated with boiling water. 4. A good plan is to paint the lowest step of the cellar stairs white. Or a folded newspaper can be tacked to the bottom step. 5. To cut new bread try using a knife which has been dipped in very hot water. 6. Fresh coffee stains can be removed by pouring boiling water through the fabric. 7. If steak is rolled in flour before frying, it will keep in the juice and make the meat more tender and delicious.

C.B.:—Iron rust stains cannot be taken out by water. Try a mild acid, such as cream of tartar, spread on the stain and washed through by hot water, or dilute oxalic acid. When the stain is removed be sure to wash out the acid.

V.D.F.:—A good play for your school concert would be "The Making of Canada's Flag," in which from fifteen to twenty-five children may take part. Another patriotic play for boys and girls is "The Key to Jack Canuck's Treasure House." It deals with our splendid national resources. Both these plays may be obtained from city booksellers at 25 cents each.

S.N.:—A mixture of one-half ounce borax, one-half ounce glycerine, three ounces rose water and two ounces bay rum will soften and whiten the hands. Cornmeal is also excellent as a whitener, and glycerine and lemon juice mixed is recommended. If a bowl of oatmeal is kept beside the kitchen sink and rubbed over the hands after washing it will prevent roughness.

Horse Sense

Chronic indigestion is indicated by the following symptoms: Unthriftiness, capricious appetite, increased thirst, irregularity of the bowels, dry, staring coat, hide bound, sometimes slight, colicky pains.

If due to imperfect mastication have teeth attended to. Give purgative followed by a dram each, ginger, gentian, nux vomica, and bicarbonate of soda 3 times daily, and food of first-class quality.

Increase the feed gradually, and give regular exercise at some kind of work.

When the hair begins to shed, the heavy coated horses should be clipped.

When not at work, have a blanket handy to throw over the clipped horse and he will not take cold.

There will be no delays in the spring work if the work teams are properly prepared at the start.

Gradually toughen up the horses that have been standing in the stable. A poor collar hurts worse than a heavy load. Adjust the traces to the length of the horse. Get your horse as near as possible to the load he is to pull.

Mud-spattered harnesses on a clear day look as if something were wrong. Wash them up after the spring storms and bad roads are over, and keep them washed. A harness that is permitted to go dirty will not last so long as one which is cleaned and oiled often.

A horse that does not eat when food is before him is wrong somewhere. Look at his teeth. Watch all danger signals.

Wind up the week's feeding with a bran mash.

Poultry

Stop feeding geese twelve or fifteen hours before you kill them.

A few sickly hens will undermine the best-founded efforts at success.

Five to ten per cent. of the feed given in winter should be meat in some form.

Fresh cold air is the only thing that will keep the hens from freezing to death.

It will help to get eggs the year around if you thin out the overcrowded houses.

When chickens are permitted to roost in and about the stables, why should there be surprise when horses and cattle become lousy?

Some folks try to make money out of geese without water. Quite like making bricks without straw. If nature has not provided you a stream or pond fed by springs, make a pond of your own. Eggs from geese that have water to swim in are more apt to be fertile than those which come from dry land layers.

The Dairy

The tested and approved cow, and the dairyman determined to do his best, make a winning combination.

Above all things let no one pester the bull. Nine out of ten cross bulls are made so by wrong treatment on the part of some one who either does not think or who does not know any better.

With all our kindness let us keep a firm hand and a good stout staff on the bull.

The cow due to calve soon should be fed only laxative, easily digested food.

Toughen your cows, not by exposing them to the raw spring winds and storms, but by daily exercise on sunshiny days, and careful stabling when the winds whisk around the corner.

Before we offer a farm for sale, we know it pays to slick it up and make it look the very best we can. Same way with a cow we want to sell. We can't expect men to take much interest in a rack of bones or a dung heap fastened to a pair of hind legs. Clean up. Put a good coat of flesh on your cow, and then offer her for sale.

Pastures which are used one week too early in the spring will generally run short at least three weeks earlier than if they had been properly conserved.

Hogs

Rig up an old pasture for the hogs this season. It will be a great saving in feed.

Lots of folks down-town never know what good bacon or ham it. Make yours extra good this year.

The constant cold weather of the past months has been the means of keeping many pigs closely housed, and this has resulted in a great many cases of crippling amongst the swine herds of this country.

It is essential that the brood sow be fed a well-balanced, succulent, nutritious, milk-producing ration while suckling the litter. Dairy by-products, such as skim-milk, buttermilk or whey together with meals such as shorts, ground oats, barley, oil cake and the like are all highly suitable for the feeding of the sow at this season.

One reason why the storms of winter break so many panes of glass in the farm homes of this country is because the putty gets loose and lets the glass break easily. Take some comfortable day very soon and go over all the winrows. Ten cents may save a dollar's worth of glass.

The Sunday School

INTERNATIONAL LESSON

APRIL 1.

Lesson I.—Jesus Gives Sight To The Blind—John 9. 1-38 Golden Text—John 9. 5.

Verse 1. Passed by. A spurious addition to John 8. 59 (see margin) would link this verse with the last. It seems quite general "one day as he went along the street." From his birth—Evidently a well-known character, whose history the disciples knew; compare verse 8.

2. Rabbi—The actual word used wherever our Gospels have "Master" (literally, Teacher). Who sinned—This is India's problem, on which the whole superstructure of reincarnation is based. Jews believed in the possibility of prenatal sins; this verse does not mean that they thought of a previous existence. Parents—Compare the old proverb about the father's eating sour grapes and the children's teeth set on edge. Jeremiah repudiated it, but there was a partial truth in it which he retained (Jer. 32. 18).

3. Jesus rejects this theory of suffering altogether. Man's suffering is only God's opportunity; compare John 11. 4, and 2 Cor. 12. 9.

4. We must—Note the rebuke to their hard theorizing in the presence of sorrow. They should be looking out for opportunities of joining their Master in his Father's works. While it is day—See John 11. 9; 12. 35. The parable itself guards against misuse: man's intellectual and spiritual work is often done at night. But just as our work for daily bread normally stops at sundown, so the opportunity of ministering to men in their sorrow will cease with death.

5. When—There is a distinct suggestion that this visit (compare John 17. 11) is not the only one. See Lesson Text Studies for March 18, verse 12.

6. Compare Mark 7. 33; 8. 23. The primitive belief in the healing virtue of saliva is used by Jesus to help faith: the point is that what heals comes from him. Anointed—Read, "put his clay on his eyes"; the margin has an improvement on the text, but it misses the true point.

7. Wash—The word used implies the washing of a part, here the face. Pool of Siloam—"Siloa's brook that flowed fast by the oracle of God," as Milton calls it. The pool is still there. Sent—That is "issuing, gushing forth." But John fastens on a mystical interpretation: the spring is a type of the water of life.

8. Beggar—As to-day in India, there was no other livelihood for a blind man who had no relatives to support him.

9. No—For of course the fact that he could see, with them disproved identity.

11. Went away—As with the ten lepers, faith was tested by bidding him leave the Healer's presence.

35. Cast him out—See verse 22 and John 16. 2. The Son of Man (margin)—So read, beyond doubt. Since this great title refers tacitly to future judgment, there is special significance in verse 39 in this connection.

37. He it is—Compare John 4. 26.

38. Worshiped—Jesus accepts a reverence which angels refuse (Rev. 22. 8, 9).

THE ART OF GRAFTING.

When in the spring the sap begins to move in the stock, be ready; this occurs early in the plum and cherry, and later in the pear and apple. Do the grafting, if possible, on a mild day during showery weather. The necessary tools are a chisel, or a thick-bladed knife or a grafting iron (with which to split open the stock after it is sawed off smoothly with a fine-tooth saw), a hammer or mallet to aid the splitting process, a very sharp knife to trim the scions, and a supply of good grafting wax. Saw off a branch at the desired point, split the stock a little way down, and insert a scion at each outer edge—taking care that the inner bark of the scion fits snugly and exactly against the inner bark of the stock. This—together with the exclusion of air and moisture until a union results—constitutes the secret of success. Trim the scions wedge-shaped, insert them accurately; the wedge should be a trifle thicker on the side which comes in contact with the stock's bark. Lastly, apply grafting wax. Each scion should be long enough to have two or three buds. The "spring" of the cleft holds the scion securely in place, and therefore tying should be unnecessary. If both scions in a cleft grow, one may later be cut away.

When grafting large trees it is best not to cut away too much of the tree at once; therefore a few secondary branches should be left untouched, and these, after the scions are thriftily growing, can gradually be cut away the following years. Or, part of a tree can be thus top-grafted one year and the remainder the next. Many a worthless tree has thus been entirely changed.

You can't graft a pear or an apple on a cherry or plum tree, or vice versa. The stone fruits and the pomaceous fruits are separate families and refuse to intermarry.

The following formula for grafting wax will be found satisfactory: Melt together until thoroughly mixed four pounds of resin, two pounds of beeswax and a pound of tallow. Pour this mixture into a vessel of cold water. Grease the hands with tallow, and when the wax is cool pull it like taffy until it becomes light and smooth. It may then be shaped into balls or sticks, and will keep indefinitely in a cool place. Paraffine substituted for beeswax makes a harder as well as a cheaper wax.

Here is a substitute for grafting wax that is much cheaper: Take common putty, put it on good and thick and fill all the cavities smoothly. Then take cloth, tear it in strips, wind it around the putty and tie it with string.

It is best to use scions which were cut very early this spring or last fall; they can be kept in moist sawdust or sank.

Bedtime Stories

THE PARIS DOLL LIKES HER NEW HOME.

It was past 12 o'clock in Toytown and the big fat Policeman had come around as he always did every night to see if there were any new dolls in the window.

Sure enough! There was a new dollie, with big blue eyes and light golden hair, and the big Policeman thought the big Boy Doll was looking at her very strangely.

No wonder, for the Paris Doll had just been put in the window of Toytown that very afternoon, and she was so very beautiful that all the other dolls stopped looking out of the window just to see her. The Brown Monkey stopped pulling the Stuffed Cat's tail just to see what it was all about. The Tin Soldiers stood up very straight as if to salute, while the Wooden Firemen looked around to see if there was a fire anywhere.

"Have you been here very long?" asked the Boy Doll of the Paris Doll.

"Oh, no," said the Paris Doll. "I came from across the water. The dear little girls packed me in a box and gave me a lot of kisses to give to Canadian boys and girls, and one of the dollmakers taught me English so that I could understand what was said to me."

"That is very wonderful," said the Boy Doll. "I hope you like it here."

"I know I shall," said the Paris Doll, "Every one is so kind."

Just then the big Policeman turned his back and the Brown Monkey threw a block at the window and the big fellow jumped right up in the air. He turned around very quickly and thought he saw all the dolls, tin soldiers and firemen laughing at him. I wonder if they really were?

Sheep Notes

Where a flock or individuals in it are not doing well, there is no mystery about it. Remember parasites, internal as well as external.

If you are up to date you will read the experiment station reports on sheep and lamb feeding, and then file them to read again.

Blessings on the ewes that bear twins, and this is the year that it will pay to raise them. In every sheep track there springs up a clover plant. Sheep and clover are great partners. For genuine pasture improvement, at little expense, the sheep is the leader. Did you ever think that millions of weeds that would otherwise mature seeds get nipped by sheep?

Many pounds of wool are lost every spring by letting the sheep run where fences and bushes will catch them and tear off big pieces of the fleece. Small matter? Nothing like this is too small for the farmer's attention.

Pity the people who live in the tropics; they never enjoy the miracle of spring.