

PAGES

MISSING

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"THE PROFESSION WHICH I HAVE EMBRACED REQUIRES A KNOWLEDGE OF EVERYTHING."

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The Prospect for the Beef Industry in Canada

By J. P. Sackville, B.S.A.

IT is estimated that Canada's cattle number slightly over 6,000,000 head, a decrease of over 1,000,000 as compared with 1907, and yet during the same period our population has increased approximately 34 per cent. The natural result, of course, has been a gradual falling off in the number of beef cattle exported during the last decade.

With the European markets for all meat animals, looming big at the present time, to say nothing of the demand at home, the question arises—is the Canadian farmer in a position to take advantage of this increased demand, or is the outlook for a permanent market sufficiently attractive for him to construct his business with a view of taking advantage of it later. In regard to the question of prices of meat for the future, it seems reasonably clear that the effect of the present conflict on the Continent has not been the sole factor in the upward tendency of prices for all classes of meat. At the same time, it must not be overlooked that the establishment of markets in Europe, due to war conditions, will have an important effect on the future development of the beef industry in this country.

The slaughter of beef herds in Europe during the early stages of the war, and the increased demand for all meats since, has resulted in a greater scarcity. Aside from any effect the above condition has had, there were other rea-

sons just as important and possibly more permanent which had an influence in stiffening prices.

A brief review of conditions leading up to the scarcity of beef animals might not be out of place. Meat production, in any form of animal production, must yield a larger tangible profit than is obtained from the selling of raw material from the farm, before we may hope to keep enough people engaged in the business to supply our needs. In other words, the returns must be larger than from hay and grain selling, as there is considerably more expense involved, in the way of more buildings, more capital and more and higher-priced labor. Further, the establishment of meat production on a stable basis must, first of all, take account of the establishment of a market for live stock which is sufficiently remunerative to remove the tremendous hazard that has surrounded the industry during the past twenty years. The older the agriculture of a country, the more artificial the environment of cattle, and the more intensive the method of production the more complex becomes the problem connected with the industry. As the problem becomes more complex and production more intensified, the cost of production necessarily increases. These are the conditions which surround the industry in the oldest settled districts at the present time. Cattle raising is, therefore, passing through a transition stage, attempting

to adjust itself to the changed conditions.—e.g. higher priced land, the necessity for competing with other industries which stand ready to pay stronger prices for feed used for cattle raising, increased cost of labor, increased hazard from disease, such as tuberculosis and contagious abortion; decrease per capita consumption of meat and increased difficulty of securing a cheap and adequate supply of feeding cattle.

It will be apparent from the foregoing that prices for all live stock were almost bound to increase and that we were on the eve of a revival in prices of beef cattle. The war coming at the time it did had the effect of stimulating the price.

In addition to the conditions stated above, as tending to increase and hold the price of beef cattle, we must also consider what effect the readjustment of trade relations with the European Countries will have on the subsequent prices of beef to the Canadian farmer. Great Britain has arranged to furnish France with 20,000 tons of frozen meat per month, and Italy with 100,000 tons per year, as long as the war continues. France is fast learning that frozen beef can be used to advantage for her armies and provided Canada can supply this demand, there is no reason why a permanent market in this commodity cannot be established with France. It is estimated that fully one-fifth of the herds of France have been depleted, being utilized in the early stages of the war to supply the demands of the army. The probability is that France will be in a position to take large numbers of Canadian cattle to stock the pastures of Normandy and Brittany to be finished for home consumption. From the report of the Live Stock Branch at Ottawa, Canadian cattle will be preferred on account

of the prevailing feeling against cattle from other countries due to prevalence of bovine diseases.

The trade in canned meats has been greatly increased and only recently the Department of Militia and Defence is reported to have placed in Canada enormous orders for over seas.

It will be noted that any outlet we may hope for our cattle in Europe, as the situation stands at present, will be with France rather than with the United Kingdoms, and a market for canned meats and feeding cattle is not the most desirable from the point of view of the Canadian cattle feeder. According to latest reports, Canadian beef does not find favor with the British consumer as compared with that from the other colonies, or the United States. The quality is lacking, and what is further against us is that Argentine, Australia and New Zealand can produce beef, both on the farms and in the packing houses, more economically than Canada.

To the farmer engaged in the production of beef there seems no question in regard to a permanent market and good prices for anything he may have to offer, even if the war should be over soon and conditions in Europe become normal again. Probably the outstanding feature as it affects the production of beef in this country is, that we must improve our methods of feeding and breeding before we can successfully compete with other meat producing countries in the better class of trade with Great Britain. If the conclusions of this article are right, the public must reconstruct its point of view with references to prices of meat. We need not look forward to an era of cheap meat, this is only possible where cheap land and labor are available. From this viewpoint the policy of the Canadian farmer should be to

look well to the class of cattle he is handling, breed only those which will give a good return for feed consumed, finish them properly, preferably at an

early age, and endeavor as far as possible with prevailing conditions to produce them as economically as possible.

Lice Affecting the Domestic Fowl

By A. W. Baker, B.S.A.

THE lice affecting the Domestic Fowl are members of the order Mallophaga and are commonly called Biting or Bird Lice to distinguish them from the sucking lice of mammals. The name "Biting Lice" is applied because of the fact that the mouth-parts of the insects are fitted for biting. The food consists of bits of feathers and epidermal scales—the lice never feeding on the blood of the host save possibly where it may have dried around wounds. The injury to chickens arises from the irritation produced by the constant feeding and probably also to a considerable extent by the sharp claws.

The loss occasioned to poultry keepers through the attacks of lice is of course difficult of estimation, but it is certain that it is much greater than is usually supposed to be the case. The injury to chicks is especially great, proper growth being prevented through the restless activity of the bird. It is even quite possible that much of the mortality of small chicks is due directly to the attacks of lice. More mature birds are also prevented from making proper growth and egg-laying is doubtless checked to a considerable extent by the weakened and restless condition of the birds. Where setting hens are used there are often losses in hatching as a result of the abnormal activity of the bird. In addition to these direct losses birds as a result of their weakened condition are more susceptible to the various diseases to which poultry are at all times a prey.

One point which makes the biting lice of great importance as ectoparasites is that the whole life of the insect is passed on the body of the host. The female attaches her eggs to the feathers of the bird and each young louse escapes by pushing off a cap-like structure at the free end of the egg. The rest of the life of the louse is then spent on the body of this bird with the exception of course that migration may take place from bird to bird during contact on the perches or in nesting boxes.

CONTROL MEASURES.

1.—*Lice Powders.*

There are many different lice powders on the market. Many are costly and some are not extremely effective. One of the most successful powders is that known as the "Lawry Lice Powder." This is not a proprietary powder and can be prepared cheaply by the poultry man. It will give extremely satisfactory results. This powder is made by adding to 3 parts of gasoline and 1 part of crude carbolic acid 90-95% enough plaster of paris to take up all the liquid. The plaster should be stirred in gradually so that a dry pinkish powder results.

This powder should be worked into the feathers of the bird especially on the more heavily infested parts of the body, that is in the region of the vent wings and under side of the body. It must be borne in mind that this powder will not kill the eggs or "nits" of the lice, and it will accordingly be neces-

sary to give another dusting and in severe cases even a third at intervals of 5-7 days, to kill those young lice which have hatched since the last dusting.

There are several grades of crude carbolic acid on the market. That of 90-95% must be used in the powder to obtain satisfactory results. The Poultry Department of the Maine Agricultural Experiment Station state that they have used cresol in place of the crude carbolic acid with good results where the carbolic could not be obtained.

2.—Blue Ointment.

Prof. W. R. Graham, of the Ontario Agricultural College, states that he has used Blue Ointment with success where setting hens are heavily infested with lice. The ointment is worked into the feathers of the bird by hand, but it must be used sparingly and very carefully.

3.—Dust Baths.

Baths containing a mixture of road dust and tobacco dust may be kept in the poultry house or in the run. Birds will make free use of these baths and the chances of infestation will be to a great extent reduced.

It will be found advisable also where brood hens are used to set them on tobacco stems which may be obtained cheaply from any cigar factory. The possibilities of infestation of the chicks will thus be greatly reduced.

4.—Carbolized Sweet Oil.

Dusting young chicks will be found to be a difficult practice. Where head lice are very bad on young chicks it may be found necessary, however, to treat them. In this case a little carbolized Sweet Oil may be rubbed into the infested regions. The oil, however, must be used *only in extreme cases and then very sparingly*, as its use in any

quantity may endanger the life of the chick.

A much surer method is to protect young birds from infestation by thoroughly treating all old birds with which they may come in contact.

5.—Disinfection of Houses.

If incubator and brooder-raised chicks are kept free from contact with old birds during their development, and are then placed in houses which have been thoroughly cleansed and disinfected, the danger of infestation is reduced to a minimum. Under these conditions any old birds which must be introduced into the house should, of course, be given two or three thorough dustings before they are allowed to run with the young birds.

Before the introduction of the young pullets the whole house, nests, perches, walls and floor should be thoroughly scraped and scrubbed and then well painted or sprayed with a mixture of 3 parts of kerosene and 1 part of crude carbolic acid 95%. This ensures absolutely lice-free surroundings for the young birds and also checks to a great extent, if it does not entirely eradicate, an infestation of red mites if such be present.

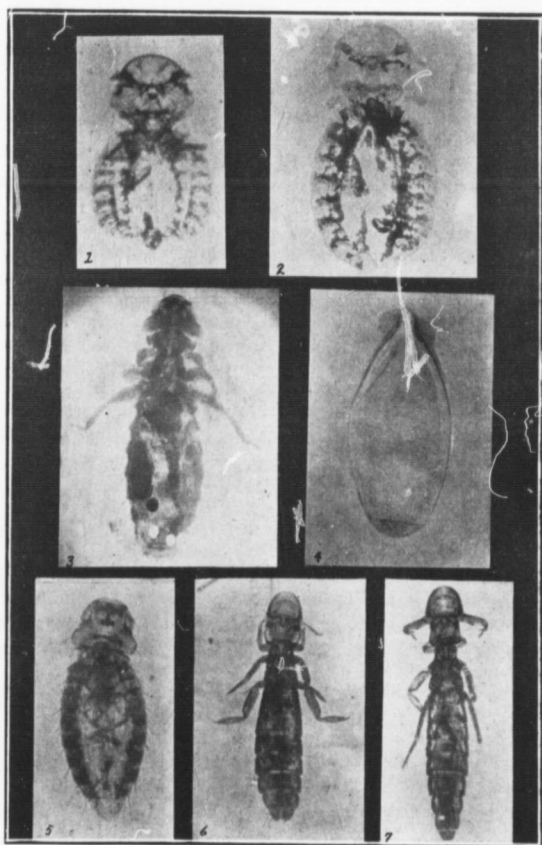
Following are the species of lice which are known to infest the Domestic Fowl in Canada with brief descriptions to aid in their identification.

THE COMMON HEN LOUSE

(*Menopon pallidum* N.)

This louse is about .04 to .06 inches in length. The body is compact, the head is long and the legs short. The abdomen tapers strongly and regularly to the posterior end and is beset with numerous bristles. The whole body is a light straw color.

This is in Canada as elsewhere the most common species affecting the Domestic Fowl. It can be readily recog-



LICE AFFECTING THE DOMESTIC FOWL.

nized by its light yellow color and extreme activity on the birds. It has been recorded in America also from the pigeon and is said by some to attack horses if such are in close proximity to lousy birds. The writer has never seen horses so attacked.

MENOPON BISERIATUM.

(*Piaget.*)

This species is about .08 to .09 inches in length. The female has the body elongate and loosely jointed, the head short and the legs long. The abdomen tapers abruptly but slightly at the pos-

terior end, and the posterior margin of the last segment bears a close series of fine hairs. The general body color is yellowish brown. The male is shorter and stouter than the female and lacks the series of hairs on the posterior margin of the last segment. This species occurs commonly and often abundantly in company with *M. pallidum*. It can readily be distinguished from the latter by its larger size and less compact form. It has been recorded in America also from the turkey and pigeon, and is said to attack the pea fowl.

THE VARIABLE CHICKEN LOUSE

(*Lipeurus variabilis* N.)

The length of this species is about .09 to .095 inches. The body of the female is elongate and slender. The head is broadly rounded in front and the antennæ are slender with the first joint short. The legs are long and the abdomen tapers weakly from the sixth segment. The color is whitish, the margins of the body and front margins of the legs being pitchy black. The abdominal segments each bear a large squarish median brown patch. The males more slender than the female and the first joint of the antenna is very large,

and bears a peg-like appendage as does also the third segment.

This species is quite common and can usually be found on any heavily infested flock.

THE LESSER CHICKEN LOUSE.

(*Goniocotes hologaster* N.)

The length of this species is about .035 to .06 inches. The body of the female is very broad. The head is squared behind, the legs short and the abdomen regularly rounded behind. The color is light yellowish brown. The abdomen of the male is much shorter and broader and squared behind.

This species is not common in Canada, though I have specimens taken at Guelph at various times. It has been recorded in the United States and I have received specimens from Prof. Haseman taken at Columbia, Mo.

EXPLANATION OF PLATE.

1. *Goniocotes hologaster* N. ♂
2. *Goniocotes hologaster* N. ♀
3. *Menopon biseriatum* Piaget.
4. Egg of a Bird Louse.
5. *Menopon pallidum* N.
6. *Lipeurus variabilis* N. ♀
7. *Lipeurus variabilis* N. ♂

Alfalfa: Premier of Crops

By Thos. Cooper, '18.

AGRICULTURE, within the last few years in Canada, has been gradually changing from grain to stock farming. Owing to the increasing value of land, the decreasing fertility of the soil and the high prices prevailing for live stock, grain farming has become unprofitable. Mixed farming is giving way to specialized agriculture. With this change has come a demand for special forage crops by those who are

specializing in beef and milk production. Such a crop is found in Alfalfa.

HISTORY.

Alfalfa has been cultivated for twenty-five hundred years. It is a habitant of central Asia. When the Persians invaded Greece in 490 B. C. it was known. The Romans carried the plant from Greece after conquering that empire in 146 B. C. Spain was the next to be benefitted by this crop. But

Europe was more interested in conquest than in agriculture and Spain was not the least ambitious. Many of her adventurers sailed to Mexico to wrest from the natives the rich silver deposits which existed there..

True, these Spanish cavaliers destroyed everything before them, but in their wake they left another conqueror—Alfalfa. It came slowly but none the less surely. It clothed desolation in emerald green, dressed the country-side in royal robes of purple, made barren wastes fruitful. But unlike the Spanish hordes and their bloody unsuccessful, short-lived campaign the conqueror, Alfalfa, is still campaigning, still conquering. Its domain has extended from Mexico northward to California, Texas and the Mississippi Valley. Settlers from the old land brought seed with them and attempted to grow it in the Atlantic States but were unsuccessful at that time. It has since overrun the plains of Minnesota, Dakota and Montana. The plant invaded Canada about the same time and is to-day gaining in popularity as its merits are becoming more fully known.

THE PLANT.

This plant belongs to the botanical order leguminosæ. The members of this order furnish very largely the nitrogen in stock and human foods. They also furnish the nitrogen supply in natural soil fertilization thereby making farms more productive and at the same time improving the mechanical condition of the soil in which they are grown. The scientific name is *Medicago sativa*. There are many species of the genus *Medicago*, but only four are of any value as a fodder crop—*sativa*, *falcata*, *ruthenica* and *lupulina*. The last named is considered a weed in this country. The others or crosses of them form the crop under consideration. They are true

perennials. The slender tap roots and offshoots therefrom penetrate to a great depth and fill the soil with many fibrous rootlets. The stems are smooth upright and branching, which grow from one to four feet in height, according to soil, climatic and cultivation conditions. The branches bear three parted leaves and pea-like flowers varying in color from a yellow to a purple according to variety and strain. The blossoms are borne singly along the stem and branches. The seeds are kidney-shaped and average one-twelfth of an inch long or about one-half larger than red clover—*Trifolium pratense*. They vary in color from an olive green to a yellow.

STRAINS AND VARIETIES.

Above are mentioned three distinct species, but the most hardy is the *falcata*. Because of cross-fertilization with the *sativa* many different variations are found in the plants' blossoms among the different strains. The strains which have proven to be the most hardy and productive are:—

- Grimms.
- Ontario Variegated.
- Sand.
- Baltic.

A FIELD OF HARDY ALFALFA.

The parents from which these strains were propagated were plants which survived many and severe winters in our northern climate. They are therefore the survival of the fittest. Being grown in the north these strains are acclimatized and suited to our northern soils.

SEED.

The greatest success can only be obtained by the use of the best seed procurable which has been selected from the hardiest strain. It must be of good size, plump and show a fair amount of lustre. (Fair, because the northern-grown seeds do not exhibit the propor-

tion of lustre that is shown by the southern-grown seed.) It should be secured from reliable growers who have clean farms. If said growers are members of the Ontario Experimental Union or some association which is making a specialty of handling alfalfa, the purchasers will be more assured of quality. It should be produced in as nearly similar soil and climatic conditions as it will have to grow under.

In the selection of seed second in importance to the above is the question of purity. The noxious weeds found in this crop are:—

Dodder (*Cuscuta*—many species.)

Ribgrass (*Plantago lanceolata*).

Rag Weed (*Ambrosia artemisifolia*).

Docks (*Rumex* - species).

Sweet Clover (*Melilotus Alba and Officinalis*).

Yellow Trefoil (*Medicago lupulina*).

Many weeds of minor importance are also found in the seed.

SOILS AND SOIL PREPARATION.

Alfalfa may be grown on a wide variation of soils, in fact only two conditions are positively against its growth, namely:—

1. Wet soil and wet subsoil.
2. Acidity.

This crop positively will not grow on low, wet undrained land. The soil, which is in this condition, is too cold and sour consequently this legume does not attain such a vigorous growth. The air which must circulate about the roots is cut off owing to the saturated state of the soil and the plant smothered. However, should the season be favorable and the seedlings live till the following spring they will then be destroyed. The frost will heave the plants breaking off many of the roots and rootlets. The chief means of sustenance is thereby cut off from the plant, it starves and immediately dies. Alfalfa will not withstand water lying on the surface

for any length of time and prefers the water-table at least six feet below the top of the ground.

The second condition—that of acidity—is due to the continual growing of a certain crop for many years on the same land thereby depleting certain plant foods especially lime. The simplest test to determine this point is to make a deep slit in the ground with a knife and into the incision thus made insert a piece of blue litmus paper. Press the earth against the litmus and leave for a few hours. If at the end of that time the paper has changed to a pinkish caste it is proof of acidity and lime must be applied to neutralize this condition. Five hundred to one thousand pounds per acre is sufficient to remedy matters.

Another of the essential points in growing Alfalfa is the preparation of the soil previous to sowing. There are four recommended methods, each of which has its champions.

The first method is the summer-fallowing of the area to be seeded until August 20th, when wheat is sown. In the spring, just before the last of the snow has disappeared from the field, sow the seed broadcast by hand or hand-seeder over the surface. This method has many advantages provided the fallow has been well taken care of during the summer and clean seed wheat has been sown. The weed seeds have germinated and the weeds have been killed by the cultivation. This frequent tillage has also liberated much plant food which was in an unavailable form. On the other hand the wheat crop will rob the young alfalfa of the moisture during the time this nurse crop is growing, although it will also shield the young plants from the scorching sun during June. But the greatest objection to this method is that the best conditions are not given

to the seed which has been inoculated with nitro culture, of which more will be said later.

Another plan is to sow the alfalfa seed with a spring nurse crop. A special clover sowing attachment is fastened on the drill and set to sow at the rate of twenty pounds per acre. The nurse crop usually used is barley, sown at the rate of one bushel per acre. Barley is used because it is a short season crop and does not stool as much as oats, therefore is not so gross a feeder. But what opportunity is offered in the spring to destroy the weed seeds which have been protected under the snow and are sure to grow up during the summer? Can a farmer during the rush of spring operations give the attention to the details of the soil preparation for this crop which demands fine tilth and proper bacteria? If the bacteria which are absolutely necessary for the best development of alfalfa be not present will the farmer take the time to use nitro culture, although very little time is required to treat the seed? Failures are due to the slighting of the details.

The third method is that recommended by practical farmers and advocated by the agricultural experts and press. Summer-fallow the area to be seeded till the middle of July then sow twenty pounds of seed without a nurse crop. The summer-fallowing brings the soil into a fine tilth, The weed seeds germinate and the young plants are then destroyed by the regular cultivation. After the seed is sown there is no nurse crop to rob the young seedlings of the moisture.

THE FARMER A BACTERIOLOGIST.

No plants of the order Leguminosæ ever attain to their fullest development unless certain bacteria be present in the soil. These bacteria are microscopic vegetable organisms capable of

extracting nitrogen from the air and changing it into a form available for the use of the plant. They not only supply the needs of the alfalfa but also collect an excess of nitrogen and store it in the roots. That nitrogen which is absorbed by the plant appears in the branches in the form of amides and protein. It is this protein which gives alfalfa its high value as a stock food. When the sod is broken up the nitrogen is set free in the soil as the roots decay. This element nitrogen is intimately concerned with the growth of plant life, therefore its value to future crops, grown on the broken-up alfalfa field, is very large.

If alfalfa has never been grown before, in all probability the bacteria spoken of will not be present in the soil. There are three recognized methods by which the necessary organisms may be brought into the land. Soil, brought from some field where alfalfa has been grown and distributed on the area to be sown, will assure the inoculation of the soil. But this method is attended with considerable risk. Many noxious weed seeds may be disseminated. Moreover, running root stocks of perennial weeds like Field Bindweed (*Convolvulus arvensis*) or Perennial Sow Thistle (*Sonchus arvensis*) may be distributed. Dangerous as these are, they are trifling compared to the loss sustained if the spores of fungus diseases as Club Root in Cabbage and Turnips—*Plasmodiophora brassicae*—Oospora scabies and Potato Canker.

The second method is the sowing of a couple of pounds of seed per acre for one or two years before it is intended to sow the crop permanently. The number of bacteria will multiply during the time the smaller seeding is growing. The organisms thus induced to multiply in the soil will be distributed by the stirring the land receives before the main

seeding is done. The cost of the seed and the possibility of the introduction of weed seeds are factors which should be considered.

But the least expensive, the most effectual and the safest way to insure the presence of the bacteria is the use of nitro culture. This is a preparation made by bacteriologists from the tubercles on the roots of the legumes. Each different legume has its own characteristic bacteria except Sweet Clover and Alfalfa which are identical. This nitro-culture can be secured from the Bacteriological Department, Ontario Agricultural College. It costs twenty-five cents for enough of the culture to treat one bushel of alfalfa seed. The directions for its use are sent with the order when it leaves the College. By the use of this preparation the nitrogen gathering bacteria are directly associated with the seed. Therefore, when the embryo is awakened into active life the radical, as it pushes through the seed coats, gathers the bacteria onto its surface. Nodules then begin to form.

SOWING.

The amount of seed per acre usually sown is twenty pounds. This can be sown broadcast by hand, but it requires a man who has had considerable practice to distribute it evenly. Even distribution is practically impossible if the slightest breeze is blowing. There are little hand and wheel-barrow seeders on the market which sow very accurately. The grain drill with a clover seeding attachment is good but unless care is exercised the seed will be buried too deeply. If it is inoculated with nitro-culture the seed should be covered up slightly as the sun shining on the bacteria will destroy them.

CARE AFTER SEEDING.

Perhaps no crop can withstand as little tramping as alfalfa during its life,



A good stand of Alfalfa in the Northern Ontario Clay Belt.

particularly in the first season. The young plants do not become established until the second or third year. Hence, if stock are pastured on alfalfa they pull it completely out of the ground or break the crowns off thereby killing the plant.

Frequently, however, the crop grows too rank before the winter sets in. If this should occur the crop will smother as the luxuriant stand will collect a large amount of snow. The best way to remedy this is to clip the tops off with the mower. Lift the cutter bar high or the crowns may be snipped off the plants. By some authorities it is claimed this clipping acts as an invigorator. When clipped there is less demand made upon the root system. Consequently the root system develops, thereby becoming more firmly established and better able to withstand severe winter trials. If the clipping is not too heavy it may be left on the ground as a mulch.

This mulch will conserve the moisture and add fertility.

But even on the best managed farms owing to weather conditions, variations of the moisture content of the soil or some other unknown causes, bare places will result in some fields. If much of the alfalfa is killed the best remedy is to break up the area and reseed, especially if the field has been newly seeded or if it is an old field whose most profitable days are done. Should, however, a farmer wish to retain his stand disking the field is recommended. Scatter seed on the bare places. The disking pulverizes the surface soil and makes a good seed bed on the bare places. Further, it splits the crown of the growing plants into two or more sections. By so doing the stand will be thickened, the stems will be finer and a better quality of hay will result. Practical farmers practice the disking even on good fields, but it should not be done until after the crop has become well established.

HARVESTING.

A crop will be produced during the second year. There will be at least two and sometimes three cuttings per year. Alfalfa starts to grow early in the spring and by June fifteenth is coming out in bloom. It should be cut when about one-tenth of the blossoms are opened or when the second growth is starting from the crowns.

Cut the alfalfa in the morning when the dew is off. Two hours later set the tedder going. This machine will loosen the swath so that the air can more readily pass through the tossed over hay. At the same time, the alfalfa which was on the bottom of the swath will be turned up to the air. The leaves are the natural evaporators or lungs of the plant. So long as the leaves are soft and pliable they will exhale the moisture from the stems. This softness and pli-

bility is maintained by the frequent turning of the hay by the tedder. Should the leaves become scorched they are more liable to drop off. Our greatest authorities on the subject of "Feeds" are unanimous in declaring that the greater food value is contained in the leaves.

As soon as dry, the hay is raked up and put into coils. It is advisable to do so before evening on the day the alfalfa is cut. These coils are left for a couple of days to undergo a sweating process. If it is impossible to haul these coils to cover they should be moved at the end of three days lest the plants be smothered below them.

USE OF HAY CAPS.

Some of our agricultural experts are advocating the use of hay-caps. Professor Storer, in his book "Agriculture", declares that hay-caps will hold the heat which has accumulated during the day, throughout the night and will consequently dry to a certain extent when, without hay-caps, the fodder becomes wet. He claims, moreover, that when dew is forming it tends to carry with it spores of moulds, fungi and particles of solid matter. This results in a dirty and mouldy hay. If the caps are used the deposition of the above foreign matter would be upon them. Hay left exposed to the dew and the rain loses much of its aroma, good color and the more soluble food constituents.

SEED PRODUCTION.

Can seed be grown in Canada? Most assuredly it can. Seedsmen concede Ontario grown alfalfa seed to be of the highest quality. While it is not so large or plump or lustrous as southern grown seed it possesses a hardiness unequalled by any samples grown elsewhere because it is grown from the survival of the best strains of the most hardy species or crosses of species to be found in the world.

The most profitable plan to follow, if seed is wanted is to cut the first crop for hay and the second for seed. The first crop may be used for seed but the aftermath would likely produce a very small tonnage of hay and perhaps none at all would be produced.

The crop should be cut when the seeds are hard but the pods not too ripe to shell. This stage is shown when the pods are a dark brown color and the seeds are fully developed. Some use the mower to cut the crop. An attendant follows and throws it into bunches in the same manner as peas are handled. Others use a reaper. This machine will cut, bunch and throw out of the horses' way, the alfalfa at one operation. The farmers in the United States are using the self-binder. They claim that not so much of the seed is wasted. The sheaves are made small and stooked in the field for ten days when it can be drawn to the barn and stored till convenient to thresh.

The threshing can be done at any time, but in this country the best time to thresh is on clear, frosty days in the winter. The alfalfa will thresh easier, a more thorough separation of seed and straw will result. Labor is not nearly so costly at this season either. A clover huller saves more seed and cleans it better than the ordinary grain thresher. The crop yields from two to five bushels per acre and is worth from fifteen to seventy-five cents per pound, according to strain.

In a material world like this the first question to be asked is "Does it Pay?" Is alfalfa worth the trouble to grow it? The most successful farmers and greatest experts declare in favor of it. The increasing acreage is ample proof that it is worth the efforts required.

The roots penetrate to a great depth into the vast stores of plant food which lie deep below the surface. Thus, they

gather their food from those parts which are not called upon to nourish the other crops. The rootlets penetrate in all directions through the soil forming a mass of vegetable fibres which leaves a large amount of humus in the soil when the fibres decay.

Millions of the most beneficial species of bacteria are induced to increase in the soil on which alfalfa is grown. Upon these organisms the success of



Alfalfa as a soiling crop.

the agriculturist depends. They liberate the plant food which is locked up in an unavailable form and so make it readily soluble and diffusible, in which form the plants must absorb their food. The bacteria which are brought into the soil by this crop have power to extract the free nitrogen of the air and change it into a form readily assimilable by the plant.

The leaves and stems produce more weight per acre of green feed than

any other forage crop except corn. It is an excellent soiling crop as it matures early in the summer and produces successive crops. When cured alfalfa produces the greatest tonnage of any of our hay crops of palatable, nutritious, appetizing feed. Chemical analysis shows this hay to be almost the equal of bran in protein. Protein is the only constituent in animal foods which renews worn-out tissue. It is therefore the most valuable portion in food stuffs. As found in alfalfa hay it is readily digestible. The flowers produce nectar of highest quality in abundance and the seed is always in demand at remunerative prices.

No other crop deserves to be boosted more than this one. It has no disadvantages except, possibly, that it will not withstand pasturing. Its advantages are many. Two sources of invaluable plant food, which no other farm crops reach, are tapped—the deeper

plant food and the nitrogen of the air. The fodder, green or dry, is the cheapest produced field crop having a high protein content. The specialist in the production of seeds will reap handsome remuneration at no loss of fertility to his soil.

The twentieth century is Canada's. Her future is wrapped up in her agricultural progress. The live stock development depends entirely upon the products of her fields. Increase the crop production and it necessarily follows that advance will be made in other lines of agricultural endeavor. Crop production depends upon fertility. Fertility is the result of careful management. Careful management consists of growing those crops which produce a large tonnage and add fertility to the soil simultaneously. Alfalfa does this. Its future is assured because its merits are becoming known. Already those who know it best designate it—"Premier of Crops."

Community Spirit

By P. L. Fancher.

EVERY rural community has a community spirit of some sort, however inexpressive it may be, for the people are usually engaged in a common occupation, and therefore, have common interests, and to some extent at least, common sympathies. The full value and measure of this spirit depends entirely upon the use to which the people put it for the development of those mutual interests and sympathies and the community spirit worth while is one which expresses itself through various organizations for a common good. Very few communities have availed themselves of the opportunities at hand to organize the lat-

ent forces within themselves and give them a direction and vital force that make them effective. But it can and is being done, and that very effectively, both to the surprise of themselves and of other communities around. So it may be said that an effective community spirit is one which pervades the whole community and finds expression in a mutual effort to make the most out of the possibilities that be within their reach.

If the value of this spirit is dependable on the use made of it, there must be some channels through which it must work. Nearly every community has its centre in a little town or village

where there is a school, and perhaps a municipal hall; the meeting places of the community, or else it is around the country school or church, for only through some existing organizations such as these does community life and thought find expression. If community life is to be quickened, and enthusiastic mutual spirit to be stimulated to a greater degree of activity it is only natural that the old organizations, already proven, should be used as centres through which new life may be given.

To make the greatest use of the latent forces at hand in any community, leadership is required. The leadership required to wisely direct should come from all those who have had the privilege of a wider education, and those who are already leaders among the people in their community. This will include the school teacher, the preacher, the district representative, and all progressive public spirited men and women. They are the ones to whom the people look for leadership and inspiration.

The expression of this spirit often commences in a very small way. On the old school grounds behind the school is a baseball ground, and a small athletic field that has been used by the school children for years. Many of the boys have learned their first baseball there. Out of this has perhaps grown up a team of some promise and note. So enthusiastic has the community become over their success, that an organization has been started to finance and manage the affairs of the team. Here is a chance for one or more of the community leaders to enter and enlarge the field of activities. An athletic association is formed, an athletic field is obtained. Perhaps it is an extension of the school grounds, a very good idea indeed. The ball diamond is improved,

and perhaps tennis courts are built, so that while the boys are practicing their ball, their sisters are enjoying a game of tennis. Part of the field has perhaps been laid out by means of a few white lime marks, and during the noon hour the teacher is teaching the boys and girls how to sprint, run long distance races, or to jump, or hurdle, or put the shot. Each race is being timed and distance measured and records kept, so that improvement may be noted. The fall of the year comes round, and an athletic meet is held, and challenges to other community or town schools or teams are sent, and a very athletic day is held with an attendance of perhaps several thousand people.

But what of the winter time when the summer activities cease? Well, here is a chance for leadership again. Things have been so successful during the fall that any suggestion for an active winter is welcomed. A Boys' Club is formed. The school and school grounds have been the centre of activity so far, so it is decided to use the school for their meetings during the winter. Out of this organization grows a debating society, or it may be a literary society, and the boys develop their ability to speak and debate, and best of all learn to think for themselves. Their society is perhaps invited to debate with a neighboring society. The invitation is accepted. To increase the fun a sleigh-ride party is organized and the mutual good times are kept up.

Spring comes again, and the teacher is anxious to widen the fields of activities. Here is where the District Representative comes in. He, together with the teacher, and those of other schools, organize a School Fair Association, and some of the energy of the older children are directed in agricultural pursuits. Father and mother become interested right here and do all in their power to

help their children. Fall comes again, and it may be this same school that is being talked about is chosen as a place to hold the fair. Another idea comes to the fore, why not hold a big athletic meet in competition with all comers at the same time? and make a day of it. Other schools may not have been organized as this one, and when their competitors toe the lines at both ends of the course they find that they are beaten.

Now the District Representative is not idle. He sees the possibility of holding a six weeks' short course in this district the following winter, and with the co-operation of the leaders such a course is arranged. The Boys' Club is approached, and through their organization final arrangements are made. During this course open meetings at nights have been held to which all are invited. A large part of these evenings is used up in discussions of the possibilities of seed and stock improvement, of drainage systems and their value, of soil fertility and soil requirements, or whatever is of most vital interest to the community as a whole. At the close of the course an organization meeting is held with the result that a Farmers' Improvement Association is formed. This association absorbs the old Farmers' Institute, and each winter together with the Boys' Club very interesting meetings are held. The farmers through this association begin to purchase their own seed, and the introduction of new varieties. Experimental tests are made and reports given in the fall. The small weather station is started, and records kept, so that they may know in a few years just what are the average temperatures of the air and soil and the climatic conditions peculiar to that district. Experiments are tried with fertilizers and reports made. So great is the interest in this associa-

tion that now they are beginning in a co-operative way to advertise and sell the chief products of their community. And so the work goes on.

The old order has given place to the new. The individual farmer does not think as he used to think. His farm is no longer his universe, nor his line fences his horizon. His interests now are broader, and are seen from the hill-tops and not from the plain alone as before. The road that could only be seen to lead across a bridge and into the woods, by the man in the valley, can be traced to the fertile fields beyond by the man on the mountain top. The community spirit that has developed all this organization, and opened the doors to the flood tide of possibilities, has widened the farmer's vision, and quickened his interests. And with what result? He is living a better and more useful life. He is farming a better farm. He has a better equipped house and a bet-to-home. At the association meetings, when an expert on some phase of agriculture, comes from the Ontario Agricultural College to address them, he understands what is said, and the value of it. He is able to ask intelligent questions, and receive useful information. The old fall fair is not like it used to be; it has been made educative and instructive. The country road does not exist in the same state of neglect as it once did, but has given place to one well kept under a good road system. This and many other things were brought about by a change in attitude, of the whole community, towards municipal affairs. The old school house has given place to the new with its basement and club rooms for the use of the country-side. The teacher is one, now, that has received a supplementary education in agriculture. Even the church has revived without the aid of a special

evangelist. The preacher has been to the Ontario Agricultural College, and taken the Summer Courses in Rural Leadership. He has a new idea now of the usefulness of the Rural Community church, and proceeds to tell it to a full house on Sunday.

Yes, it is all right to shout for co-operation and revised economic conditions, but the very spirit upon which co-operation is based, and economic conditions bettered, must come from the people themselves, and is identical with the community spirit. Community spirit educates the people from whom it emanated. It begets community enterprise and fosters and stimulates a

wider field of possibilities, and vision becomes larger and clearer. In it there is mutual understanding and appreciation, and above all a unity of thought and purpose. The community spirit, or co-operative spirit if you will, may be likened to an arch in a high wall through which a community must pass if it is to accomplish the most possible; the farther away one gets the more limited the view and the smaller the horizon appears beyond, while the closer one comes to it the wider the horizon and the higher the sky grows until the arch is reached and the whole world of possibilities beyond it lies open to view.

That Pasture Lot; or Pasture and Pasture

By A. W. Guild, '17.

THE best blood of Great Britain and the Colonies is being sacrificed to uphold the rights of humanity and to preserve our homes and the integrity of the British Empire. This is an hour when if ever, we, as Canadians must play the game and play it with every ounce of strength we have. Major-General Sir William Otter said: "One of the greatest services which the Canadian people can render to the Empire at present is to increase our supply of food for the British people."

Right royally have the farmers of our country answered this call and that of the "Increased Production Campaign." Laboring under the disadvantage of an unequalled shortage of skilled labor, I say that the Canadian farmer can be justly proud of last year's record. We would not be true Canadians, however, if we did not determine to reach a new high-water mark in crop production this coming season.

To this end there is greater opportunity for improvement in pasture land than in any other phase of farm work. Professor C. A. Zavitz says, "It is probably safe to say that pasture production in Ontario is one of the weakest parts of the agriculture of the Province." One-fourth of the tillable land of the province is devoted to pasture, and the proportion is rapidly on the increase. But while we have so large an acreage, there are many Ontario pastures composed of old timothy sod. Timothy is the most widely used of any pasture grass, and yet other varieties rank higher in value. Especially in a dry season an old timothy sod furnishes very, very little pasture.

ANNUAL CROP FOR PASTURE.

Frequent inquiries made by farmers as to what could be sown in the spring of the year to furnish the best results in the same season have prompted extensive experimentation to discover the

best varieties or mixtures. After testing seventeen crops separately, and in six different combinations, the Ontario Agricultural College recommends the following to be sown as an annual pasture:

Oats 51 lbs., Early Amber Sorghum 30 lbs., Common Red Clover 7 lbs., total 88 lbs.

The oats and sorghum are mixed together and are sown from the grain box of the seed drill, and the clover is sown from the grass seed box placed in front of the tubes of the drill. Sown the first week in May it can be pastured the 20th of June. The oats come quickly and rapidly, the sorghum is later, and does best in real hot weather. The clover comes along in the fall and if desired may remain over to be cut the following year.

This annual pasture has stood the test. In an average of nine years it has maintained one and one-fifths cattle per acre per season. They thrive, and do well. Many farmers are getting splendid satisfaction with this crop.

PASTURE CROP FOR TWO OR MORE YEARS.

Red Clover.....	6 lbs.
Alsike Clover.....	3 lbs.
Orchard Grass.....	3 lbs.
Meadow Fescue.....	3 lbs.
Timothy	3 lbs.
—	—
Total	18 lbs.

The above mixture is the best mixture known to sow for pasture purposes for a short rotation. It may be sown either with or without a grain crop. It should all be sown in front of the tube drill, the clover and timothy from the grass seed box, and the meadow fescue and orchard grass by hand. This mixture will start early in the spring, will furnish far greener growth than timothy in the hot summer weather and

more abundant growth of leaves in the autumn.

PERMANENT PASTURE.

The following mixture, which is the result of twenty years of careful testing and comparison, receives the recognition and recommendation of the best authorities both in Canada and the United States:

Alfalfa.....	5 lbs.
Alsike Clover.....	2 lbs.
White or Dutch Clover.....	2 lbs.
Orchard Grass.....	4 lbs.
Meadow Fescue.....	4 lbs.
Tall Oat Grass.....	3 lbs.
Meadow Foxtail.....	2 lbs.
Timothy.....	2 lbs.
—	—
Total.....	24 lbs.

If one uses a nurse crop, either wheat or barley is recommended. Oats are not advised. The mixture may be sown either with or without a nurse crop. It is best to sow on land that contained a carefully handled cultivated crop the previous season.

At the present time extensive work is being conducted with some forty plots of varieties and mixtures of pasture grasses at the Ontario Agricultural College. Also individual plants of timothy, orchard grass, meadow fescue and others are being tested side by side, and superior strains are expected to result from this work.

"There is a great need," says Professor W. J. Squirrel, "for more information on pasture crops. In the hopes of meeting this need in some measure, it is proposed to publish within the next few months a bulletin devoted entirely to pasture and pasture crops."

For more detailed information on this subject I would refer the reader to Bulletin 228, "Farm Crops," by Prof. Zavitz, obtainable on application at the Ontario Department of Agriculture.

Crate Fattening of Cockerels

By H. W. Clark, '17.

THE first of the surplus cockerels marketed in the early fall bring good returns, but by the time the latter ones have reached a marketable size, the market is generally glutted and only the prime, well fattened birds bring high prices. Thus the question of how best to fit cockerels for market has been a live question with a large number of farmers.

The European poultryman has met with good results in cramming, but those who have tried it on this side of the Atlantic have had no very encouraging results.

Probably the best results that have been realized by Ontario poultrymen and farmers have been secured by crate fattening, which in the main consists of confining the birds in crates for a period of about three weeks and following a definite system of management and feeding as described below.

The crates used are generally open structures of slats and wire netting. Many use old packing boxes, taking off front and bottom and substituting slats in their places. During warm weather these crates should be placed outside in some place where they are sheltered from rain. In cold weather they should be placed in a building where they are protected from rain, cold and wind. In this case the building should be darkened and the birds kept as quiet as possible.

After each lot of birds the crates should be painted with a liquid lice killer such as coal oil or a solution of crude carbolic acid.

The birds are generally allowed free range until 18 or 20 days before the day set to market them. They are then gathered in, dusted well with sulphur

or insect powder and placed in the crates allowing about 1 square foot of floor space per bird.

After being starved for the first 24 or 36 hours they are given their first feed, which should not be more than 1 ounce of meal per bird. Twelve hours later they should be fed again the same quantity. After this feed the quantity should be gradually increased until at the end of 8 or 9 days they are eating all they will clean up inside of 12 minutes. In fact no food should be ever left in front of them for a greater length of time. They should be kept up to this quantity for the remainder of the period.

The feeds should be exactly 12 hours apart and these appointments with the chickens should be attended to with the greatest regularity. It might be well to note here that birds will eat equally well by lantern light or daylight. If the weather be warm they should be given a drink of water in the middle of the day. Grit and charcoal should be fed frequently throughout the feeding period.

Good results have been obtained from a large number of rations but the best have probably been secured from one recommended by Prof. W. R. Graham, made up as follows:—

- 2 parts finely ground oats.
- 2 parts finely ground buckwheat.
- 1 part finely ground corn.

The varying quantities of these meals are mixed and twelve hours previous to feeding should be made into a mash with buttermilk or sour milk. If milk be not available, whey and 5 per cent. commercial beef scrap, or water and 10 per cent. beef scrap may be used, but when possible milk should always

be used, because it not only supplies the animal food which is so necessary, but also has a beneficial effect on the digestive system of the birds.

SHIPPING.

Crate fattened birds should never be shipped alive as the system of feeding tends to soften them to such an extent that they cannot stand a long trip or rough handling. They should be starved for at least 24 hours before killing, which should be done by bleeding in the mouth. They should be dry picked and one should be very careful not to tear the flesh, always giving the feathers a quick little sideways jerk.

RESULTS.

An analysis of the following statement will give the reader an idea as to what returns he may expect from crate fattening. These figures represent only average results and are the actual results of a test carried out by the writer.

At the time this lot was sold ordinary spring cockerels were a drug on the market and were bringing 10 to 12 cents per lb.

Weight and value of cockerels when put in crates, 45 lbs. at 9 cents.....	\$4 05
Cost of ground grain, 82 lbs. at 1½ cents.....	1 23
Buttermilk.....	50
<hr/>	
Total cost.....	\$5 78
Dressed weight of poultry 51 lbs.	
Weight of cockerels at commencement.....	45 lbs.
<hr/>	
Gain weight.....	6 lbs.
Returns from poultry, shipped 51 lbs. at 17 cents.....	\$8 67
Total cost.....	5 78
<hr/>	
Net profit.....	\$2 89
Net profit per bird, 24 cents.	

The Salvation of the Egg

By M. H. Coughlan, '16.

THE worst eggs on the Montreal market come from Prince Edward Island," said Harper R. Gray, manager for Gunn, Langlois Co., Montreal, in July, 1912. Admitting the truth of the above, we will try to give an idea of the conditions which made such a statement possible.

At that time all eggs in the province were sold by farmers to local merchants.

The latter in turn sold them to one or other of three large wholesale firms who candled and exported them. The merchants paid the same price for all kinds of eggs, so that the farmer got as much money for stale, dirty, or small eggs as he did for good ones. Is it to be wondered at then that no care was exercised in gathering or storing? The result was that they were more or less

stale when gathered, and in the majority of cases were placed in warm ill-ventilated pantries to remain till someone went to the store, which might be a week or even two weeks later.

Having arrived at the store, they were generally placed in an outhouse or warehouse in close proximity to fish, vinegar, oil and other things, the odor of which would taint them. Here they remained probably for a week or ten days and were then loaded on a truck wagon and very often got a merry drive to the nearest railway station. From here after several rough handlings by trainmen and truckers they reached the exporter's warehouse.

To make matters worse, a large percentage of the eggs were taken in exchange for goods by peddlers sent out

by the merchants. They put them in large wooden boxes on the wagons and trucked them around over rough country roads under the burning rays of the sun for perhaps a week before shipping. The three exporters candled and graded all the eggs of the province, and considering the deterioration they must have undergone before passing into their hands, it is not to be wondered at that the percentage of rejects and low grade eggs was high, and prices paid to the farmer correspondingly low.

ORGANIZATION BEGUN.

Such was the state of affairs in 1913 when Mr. T. A. Benson, of the Live Stock Branch, Ottawa, arrived in the province. He at once proceeded to call meetings throughout the province with a view to inducing the farmers to form egg circles. His addresses at the first meetings were listened to respectfully, and there the matter ended. Farmers whom he approached personally laughed at the idea of shipping their own eggs. After about two months of strenuous work he succeeded in organizing two circles. Accounts of the increased prices which the members of these circles received for their eggs soon reached every part of the province, and in a remarkably short time requests for organization came pouring in. During 1913, about fifteen circles were organized. They shipped their eggs carefully gathered according to circle rules, to Gunn, Langlois Co., Montreal, receiving about four cents more per dozen than the local merchants were paying.

A NEW DEPARTURE.

During the next two years the number of circles kept steadily increasing, so that in 1914 a central organization was formed for the whole province. But it was not until 1915 that the united circles determined to try some-

thing which had never been heard of before in the co-operative marketing of eggs, namely, the candling of their own eggs. The Provincial Government was approached regarding the matter, and agreed to deposit collateral with the banks to enable the association to proceed.

A large unused soap factory in Charlottetown was rented as a candling station, and a competent manager, Mr. George Lightiser, was hired. A better man could not have been found, for "George" has been in the poultry business since his boyhood days, and is, moreover, a shrewd business man. He feels quite certain that the only thing necessary for the success of the undertaking is the unswerving fidelity of the members to the principles of co-operation. To use his own words, "If the farmers stand by each other there is nothing to hinder it from being a success."

Their's was an uphill road. They had no market, no cases, and no candlers. To make matters worse, many local merchants raised the price of eggs to try to kill the association. Circle stamps were used by them to stamp stale eggs, so that the use of stamps had to be discontinued, and check cases used instead. Notwithstanding all this however, the first year has passed by successfully, and extension preparations are being made for the work of the coming season. The members are quite convinced that if it were not for the Prince Edward Island Co-operative Egg-marketing Association, they would be receiving much less for their eggs.

Prince Edward Island eggs now on the Montreal market are second to none.

At the Canadian National Exhibition at Toronto last year they lost first prize by only half a point, this being for color only.

GREATER SUCCESS DEPENDS ON CAPITAL.

In the future to make a greater success of marketing, considerable capital will be required. An instance of this need may be cited. In July the manager found it difficult to find a market for seconds, and a considerable quantity accumulated. As an experiment he got \$1,500 from the bank on his own note for three months, and with this

money paid the circles. He placed the eggs in cold storage, and in less than two months he sold them, clearing \$1,000 which he placed to the credit of the association.

Eggs in the local stores, as well as peddlers on the highways have now almost disappeared, and with them stale Prince Edward Island eggs have disappeared from Canadian markets.

The Governor of Many Actions

Many and Varied are the Uses of the Thermometer in Our Daily Routine on the Farm.

By J. C. Neale, '17.

THE ordinary, everyday thermometer may be used with profit a dozen times where most of us use it but once—or perhaps not at all. This statement applies particularly to farming. Usually we have a thermometer about the place somewhere—one that was given to us by a chewing gum firm for letting them paint their advertisement on the end of the barn—but we keep this one securely nailed to the north-east corner of the woodshed so that we may be able to see how cold it is when we go out in the morning. This is truly a good thing to know, but the north end of a building is not the place to get a representative reading.

HANG THE THERMOMETER IN THE OPEN.

The thermometer should be hung in some place in which there are no superficial air currents, but where there is a good general circulation, regardless of the direction of the wind. This will give a much more accurate account of the average temperature of the air in the vicinity. A shelter about five feet from the ground, made of slats, nailed shutter fashion to the frame, will keep

the direct rays of the sun off the instrument and yet allow for perfect air circulation. If it be possible to secure both maximum and minimum thermometers to place in this shelter, more accurate information may be obtained.

On first thought, this information may seem of no practical value. But consider the matter a moment! A record of these readings will tell us whether or not the extreme heat or cold may have been responsible for the poor returns from some new crop we had been trying. If the extremes of temperature were much greater than this crop could withstand successfully, we would be wise to have nothing more to do with it. In no other way could we find this out than by the use of the thermometer.

If the farm be of a rolling nature, we may supplement the readings in the permanent shelter with readings in the hollows and on the hills. A few actual experiments will give us a comparison between the temperatures of the various high or low points with those at the shelter and we can then calculate from the latter the approximate temperature

at any of the former points. This will be an able guide in planning the distribution and rotation of crops over the various parts of the farm.

IN THE DAIRY.

One of the essentials of an efficient farm dairy is a good thermometer. Butter made from milk, churned at "about the right heat by the feel of it," is usually most erratic in nature. One churning is splendid; the next has to be sold at a considerable reduction in price, because of its poor taste and appearance. When the thermometer is used to denote the proper churning temperature, the quality of the butter from the different churnings is more uniform and more likely to establish a good name for itself on the market.

THE STORAGE CELLAR.

It is a well known fact that vegetables, fruit and roots withstand decay for a much longer period if kept at a low temperature. At the same time, this temperature must not go below the freezing point. A thermometer, hung in the middle of the cellar will show the temperature at any time and enable us to heat or cool the cellar accordingly. If bees are stored in the cellar over winter, the thermometer is indispensable. Bees must have an even temperature throughout the cold season or the expansion of the cluster in a warm atmosphere and subsequent gorging with honey to supply heat as the temperature falls is certain to cause dysentery.

IN THE INCUBATOR.

Where artificial incubation of eggs is practised the heat can be regulated only by using a thermometer. The necessity for keeping a constant temperature

during this operation need not be emphasized. A fluctuation of two or three degrees at a critical moment may mean the loss of the hatch. This fluctuation might easily occur, did we trust to our sense of feeling to regulate the heat supply.

FOR THE FRUIT GROWER.

Another important use for the thermometer is to denote the approach of frost in the orchard or garden.

The period of possible frost is, indeed, an anxious time for the man to whom a few degrees below freezing may mean the loss of thousands of dollars. The thermometer denotes the actual degree of temperature and if, during the night, the danger zone is reached, precautions may be taken to keep the fruit from freezing—by the use of smudge-fires or other artificial means. To prevent needless worry and attention, an electrically connected thermostat may be set to ring a bell in your bedroom, when the thermometer registers the particular temperature which you think is dangerous.

SUGGESTIONS IN BUYING.

We see, from the foregoing, that the farmer cannot afford to be without a thermometer. When buying, it is well to get one of the best. It may cost a little more but its reliability is worth the increase in price. At any rate, be sure to get one on which the scale is etched on the glass instead of being painted on a wooden back. There will then be no danger of a mistaken reading from the sliding up or down of the tube. Different types may be necessary for different purposes, but the above rule holds good for all.

Agricultural Training for the Ontario Child

How shall our Boys and Girls receive their First Impressions of Agricultural Science? From the View-point of the Teacher.

By Winnifred Westcott, '15.

IN Ontario, the question, "Shall Agriculture be taught in the Public Schools?" has been reached and decided in the affirmative. The question now is, "How shall it be taught?"

Anyone conversant with the normal child's mind, knows his inborn curiosity for bugs, beetles, bumble-bees ad infinitum. He also knows the child's passionate desire to *do* things, himself, all by himself.

These are the child's contributions to the study; what is the teacher's part? This is driving the question home. What is the teacher's part, and who is to be the teacher?

Shall the teaching of Agriculture be placed on the school curriculum, and then become a farce in the hands of city girls, just through Normal School, who go to the country and in their youthful enthusiasm exclaim over Berkshire cows and Tamworth sheep, and think dodder is a kind of green feed. Better leave it off the school program entirely, and trust that the boy will learn at least as much as his father knows, at home.

This science of Agriculture is not a simple thing; it can not be picked up in a few minutes at Normal School or even in a summer course; although these are wonderful to open the eyes of the average student to what he *doesn't* know.

Then, if Agriculture is to be taught, qualified teachers must be procured. And where? They should be gradu-

ates of an Agricultural College. This is impossible without that great means of rural education for which all educational leaders are striving, "The Consolidated Rural School." That is the solution of the difficulty, and of many other rural educational difficulties, as well. In the Consolidated School the District Representative could teach one day a week, lessons that would be worth while, lessons that would make the boys desire to stay on the farm.

The first objection would be that the District Representative hasn't time. Very true, maybe. Then increase the number of District Representatives until they *can* take care of the Agricultural Teaching in the schools. What influence on Agriculture has a District Representative now, who has such a large territory to cover that he can come to the school only once a year, rush in, drop the seeds and eggs and potatoes on the teacher's desk, and rush out again to his auto to get on to the next school and the next, so the many schools will get their seeds and eggs before it is too late? The children are a little dazed by his sudden entrance and departure, and the teacher tries to explain that it is to teach agriculture.

To bring this land to be the foremost agricultural country in the world, there must be more thorough work done by those qualified to do it, so the boys will see farming as a desirable social and business proposition.

They must gain a practical, sensible knowledge of the growing processes of the vegetable world, of the many insect enemies and how best to combat them. They must know the intricacies of stock-judging and feeding. They must know the why and how of drainage. They must learn the commercial end of the farming business, (how

many a boy has left the farm as he loathed "peddling.") The nature study teaching in the schools is good, the agricultural teaching of the Summer School graduates is better, but only in a Consolidated Rural, Public and High School, with an agricultural expert on the staff can the teaching of Agriculture be adequately accomplished.

The Cooking Box

By *Laura E. Nixon*, '17.

"We may live without friends,
We may live without books,
But civilized men
Cannot live without cooks."

TRUE! But if the cook is up-to-date she will take advantage of every convenience that will make her work more enjoyable.

There has been so much misunderstanding caused by calling a cooking box a "fireless cooker." Many people have the idea that no heat whatever is necessary for its use. Some men think that food put into it absolutely cold will come out smoking hot. When one sees the very latest model of this modern device it is not hard to believe that this would be possible. The box with its dull aluminum lining and neat aluminum containers, with their tightly clasped lids, looks capable of almost anything. But it is not capable of doing the impossible, and it is here that so many mistakes have been made by the novice in using a cooking box, for only as much heat as has been put in will be retained.

A cooking box does not only mean the most expensive model that is on the market, it may mean the simplest of home-made devices. A cooking box consists in its essentials of a receptacle for hot food and a container for this re-

ceptacle which is packed and otherwise insulated with suitable material so that the heat will not escape but the food will remain hot and continue to cook.

This principle is by no means a new one; it has been applied for uncounted years. For generations the Norwegian peasants have used hay boxes in which to keep their food at cooking temperature during the day while they are at work, returning home at night to find a hot dinner awaiting them. We who have had "clam bakes" at the shore know how delicious is food cooked in this way.

It is unnecessary to describe the exact construction and various advantages and prices of the commercial cooking box; these may be found in the advertising section of any current magazine. But it is of interest to note just how some enterprising housekeepers have constructed cooking boxes for themselves. A wooden box, a trunk, a galvanized iron ash-can and a wooden candy-pail are among the articles that have been successfully used for the home construction of cooking boxes. The food containers used have been of agate, aluminum, galvanized iron or tin, but always with tight-fitting covers. For insulation ground cork, sawdust, excelsior, mineral wool, crumpled paper, shavings, straw, hay, etc., have been

used. Sheet asbestos has proved to be best for lining the outer case and covering the inner bucket. A cushion about three inches thick filled with non-conducting material is used to fill the space between the top of the inner bucket and that of the outer box. With these various articles very successful cooking boxes can be made.

Someone who witnessed a very successful demonstration with the cooking box said, "It is a fine thing and a great success, but it takes brains to run it." The remark was very much to the point. While the actual operation of

the cooking box is simplicity itself, still one must be willing to give some real thought to it in order to secure the best results. As this must also be done with other methods of cooking no one should be discouraged by one or two failures. If the manufacturers of "fireless cookers" could supply with each cooker the quality of "gumption" required to run it successfully no housekeeper would be without one. To the woman who is willing to use patience, judgment and a little time in experimenting the cooking box is worth honorable mention.

IF—

If you can keep your head when all about you
Are losing theirs and blaming it on you;
If you can trust yourself when all men doubt you,
But make allowance for their doubting too;
If you can wait and not be tired by waiting,
Or being lied about, don't deal in lies,
Or being hated don't give way to hating,
And yet don't look too good, nor talk too wise.

If you can dream—and not make dreams your master;
If you can think—and not make thoughts your aim;
If you can meet with triumph and disaster
And treat those two imposters just the same;
If you can bear to hear the truth you've spoken
Twisted by knaves to make a trap for fools,
Or watch the things you gave your life to, broken,
And stoop and build 'em up with worn-out tools.

If you can make one heap of all your winnings
And risk it on one turn of pitch-and-toss.
And lose, and start again at your beginnings
And never breathe a word about your loss;
If you can force your heart and nerve and sinew
To serve your turn long after they are gone,
And so hold on when there is nothing in you
Except the Will which says to them: "Hold on!"

If you can talk with crowds and keep your virtue
Or walk with Kings—nor lose the common touch.
If neighbor foes nor loving friends can hurt you,
If all men count with you, but none too much;
If you can fill the unforgiving minute
With sixty seconds' worth of distance run,
Yours is the Earth and everything that's in it,
And—which is more—you'll be a Man, my son!

—Rudyard Kipling.

THE O. A. C. REVIEW

REVIEW STAFF

J. C. NEALE, *Editor-in-Chief.*

D. M. McLENNAN, <i>Agricu'l</i>	H. H. SELWYN, <i>Alumni</i>
J. COKE, <i>Experimental</i>	C. M. NIXON, <i>College Life</i>
C. C. DUNCAN, <i>Horticulture</i>	A. H. WHITE, <i>Athletics.</i>
W. STRONG, <i>Poultry.</i>	D. C. McARTHUR, <i>Artist.</i>
W. J. AUSTIN, <i>Query.</i>	H. J. SULLIVAN, <i>Locals.</i>
MARY BIRKETT, <i>Macdonald</i>	

EDITORIAL

DOCTOR C. A. ZAVITZ.

In the Alumni columns of this issue of The Review, appears a cut of Professor (as he is still known to most of us) C. A. Zavitz, together with the account of his receiving the degree of Doctor of Science. It is with a feeling of unmixed pleasure that the Review is enabled to record this honoring of one of the first graduates of our College, and one who, since his graduation, has been among those foremost in the upbuilding of this institution. Greater success, from the material standpoint, might have been his, had he chosen to accept any of the numerous offers, with which he has been besieged, and commercialize his knowledge and ability, but as intimated by Dr. C. C. James, in his introductory address at convocation, he has remained loyal to Canada. Nor has he worked for personal fame, but has ever kept in the foreground,

the College with which he has been associated, until to-day the terms "Zavitz" and "Ontario Agricultural College" are almost synonymous to the leading agriculturists of Canada and the United States and even of Europe. We are glad that in Canada, the land to which he has remained so loyal, and by the University with which his College is affiliated, he has been so befittingly honored.

To Dr. Zavitz, The Review extends most hearty congratulations and sincere wishes for even greater success in the years to come.

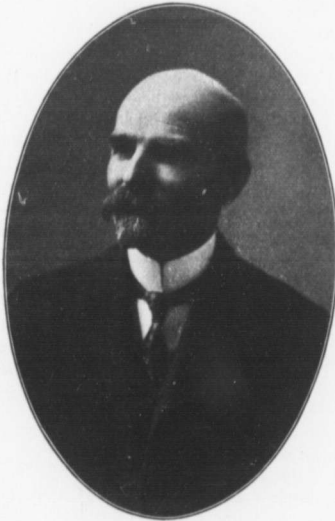
ADDITIONS TO "OUR ROLL OF HONOR."

Since the publication of the O. A. C. Honor Roll in the May issue we have received a considerable number of communications from our readers, giving us more names to add to the list. We would greatly appreciate the receipt of

still further letters in this regard, that in the July issue we may publish a supplementary list, containing the names

of all who were, through lack of information, on our part, omitted from the previous Roll.

Alumni



DR. C. A. ZAVITZ.

PROFESSOR C. A. ZAVITZ HONORED.

In Convocation Hall, Toronto University, on Friday, May 19, 1916, Professor C. A. Zavitz received the degree of Doctor of Science. The readers of *The Review*, to most of whom Doctor Zavitz is known personally, will be greatly pleased to hear of the honor which has at last come to this man who has done so much for Canadian, and especially Ontario, agriculture. Below is the address delivered by Dr. C. C. James, Agricultural Commissioner, in introducing Professor Zavitz on the day of convocation.

Mr. President,—

I have the honor and the pleasure to present to you Mr. Charles Ambrose Zavitz, Professor of Field Husbandry in the Ontario Agricultural College. Professor Zavitz is a worthy representative of Canadian rural life: he is a descendant of sturdy pioneers who many years ago came from the United States and took peaceful possession of the virgin land in the western part of this Province, and who brought to this country those sterling qualities which the members of the Society of Friends have so carefully cultivated for many generations. I am sure you will be pleased to honor one who has been true to this ancestry.

He was a member of the first class of the Agricultural College to receive from this University in 1888 the degree of Bachelor of the Science of Agriculture.

For thirty years he has been a student and investigator of plant life in both outdoor and indoor laboratory, not only in Canada but also in the United States and in Europe. All through these years he has devoted his energies to the increase of the product of our fields, and has thereby contributed something that cannot readily be measured in maintaining the stability of this country in the crisis through which we are now passing. To him, a man of Peace, this country at war owes a debt which we are to-day acknowledging. Through his perseverance, skill, and scientific training, food production has been stimulated and varieties of grain have been originated

that are helping us to fortify our country. Through his direction of the largest experimental organization in the Empire, The Ontario Experimental Union, he is exerting a most beneficial influence upon the whole agricultural life of this Province.

He has devoted his life to the calling into which he was born and in which he inherited most honorable qualities from worthy parents. His services have been sought for abroad, but he has preferred to remain loyal to Canada. He has done well for this country, and it is fitting that this University should, at this time, when his services are so fruitful, recognize him, his work, and his College. I am, therefore, authorized by the Senate of this University to present to you Professor Charles Ambrose Zavitz, to receive the degree of Doctor of Science, *honoris causa*.

WINDSOR'S WELCOME TO CORPORAL
BENNY BLANCHARD ON HIS RE-
TURN FROM THE FRONT.

By a Private.

On Tuesday, April 18th, after a varied and pleasant afternoon's march, we were lined up on the old Fort Hill. The rumor — as rumors will — ran through the ranks, "we are going on parade at the station to receive the General." "Good old rosy-cheeked fellow," said some, "he's worth meeting." "He'll make us late for supper," murmured others. So with the band of the 112th we were marched to the station, full of a warm expectation that we should welcome the genial General Benson.

At the station the pageantry grew until it became quietly pompous. Now pageantry at any time, or in any place, is only meant to create a fitting background, and lend necessary ceremony to the reception of one or more per-

sons. I have seen pageantry of many kinds. I have seen Teddy Roosevelt received, and heard him speak in the Guildhall, London. I saw the glory of pageantry at the funeral procession of King Edward VII. Then it was that I saw the Kaiser astride a charger, abreast of King George V, immediately behind the gun carriage containing the casket. I saw the glory of the Coronation of King George V. I have seen a Mayor and his Council receive and decorate a miner, who, in the bowels of the earth, rescued his mates at the risk of his own life. In the Albert Hall, London, I have twice seen the late General Booth received after his world tours. (And all things considered, no organization can create more impressive pageantry than the Salvation Army). Many times I have felt that pageantry was nothing more than a mere show, and the attendant ceremony, sick with insincerity. Then I would have a wearisome loathing and wish to get away.

But this unpremeditated display at Windsor Station was not to receive a General, nor Royalty, nor some noted politician or statesman. It had more heart in it than that. It was meant as a spontaneous and sincere welcome to Corporal Benny Blanchard, who went out with the 13th Highlanders early in the war, and who has returned home wounded. Figure my surprise, when, after the three cheers had died away, there came full face before me a pallid soldier, with a bandage round one eye, and an otherwise disfigured face. This demonstration was therefore meant as a background for Benny Blanchard to stand out in bold relief as a modest hero.

I saw confusion written all over his sad face. The tide of emotion would have run strong enough in his heart

had he been permitted to step into Windsor quiet and unobserved! But to receive him by surprise in this good way, with the officers and band and soldiers of the 112th on parade, and the Mayor and Corporation of the town to say "welcome" whilst most of the civilians of the town looked on,—these things put the high tide of emotion into flood, and as Corporal Blanchard said in his reply to the welcome he "felt queer from head to foot."

In the parade I was fortunately standing close to Mayor Roach as he tendered in a quiet voice a hearty welcome back home to Corporal Benny Blanchard on behalf of the Town and County. He reminded him that we all felt proud of the spirit and devotion and sacrifice he had made in the cause of Liberty and Right, and hoped that the rest of his life would be spent in happiness and quiet.

Ven. Archdeacon Martell (who is Chaplain to the 112th) also spoke and gave him a hearty welcome back.

Corporal Benny Blanchard, in his reply, told us that he was taken by surprise, that he never expected such a welcome from the old town—that he was too overcome with emotion to say what he felt—that he had only "done his bit"—that thousands of others had done and were still doing their bit,—that he thanked them for the welcome they had given him.

The band of the 112th, which is fast gaining a good name, rendered suitable music for the occasion.

So we received this modest comrade, Benny Blanchard. We marched back to our quarters and the pageantry passed away quickly like the morning cloud and the early dew. But not the welcome and gratitude. These remain. And what about the reception at his home? For after all, the

true reward of a faithful man is not the applause of the street which comes and goes, but the "well done" of that select circle which knows him best and loves him most.

At the supper table I heard the remark: "If we get to the Front I wonder if we shall ever get back anything like him?" Yes, we wonder! But back or not, we will go forward and "do our bit," and leave all issues in the secret keeping of God.

The above article from a Halifax paper was sent to The Review recently by Lieut. C. A. Good, of Truro, N. S.

"Corporal Benny Blanchard" is B. H. C. Blanchard, B.S.A., '14, who was between his graduation and enlistment, employed on the staff of the Farm and Dairy.

O. A. C. CASUALTIES.

We are sorry to report the death from wounds of Pte. E. J. Fitzgerald, of '16, whose name recently appeared in the official list of Canadian casualties. Pte. Fitzgerald was a son of Mr. and Mrs. E. J. Fitzgerald, of Nissouri Township, Middlesex County. He enlisted with the 38th Battalion but later was transferred to the Princess Pats. He belonged to the grenade company and lately had been instructing classes in bomb throwing, when not in the trenches.

At College, "Fitz" was an able student and popular among his fellows.

Sympathy is tendered to his parents, in their bereavement. The College sorrows with them.

Harry Westra, of '17, has been recently reported "missing, supposed to be killed" in the official casualty list. He enlisted shortly after the outbreak of the war, and belonged to the Machine Gun Transports, 19th Battalion,

recently operating in Belgium. A letter, written from Belgium on March 16th, appeared in the May number of The Review.

Westra came from Northern Ontario, from the vicinity of Sault Ste. Marie. During his one year at College, his geniality and optimism gained him many friends, who will sorrow to learn that he has been called upon to make this greatest sacrifice in defence of his country.

J. A. Steele, of '16, is reported wounded in the casualty list of May 19th. Steele enlisted in the spring of 1915 with the Universities Company. We trust that his wounds may not prove serious and that he may soon be able to return to the trenches.

Lieut. R. K. Brydon, of '18, has been reported wounded in action in France. He has been admitted to one of the French hospitals. Lieut. Brydon enlisted with the 9th Battery and left for England in August, 1915.

He received a commission while his unit was completing its training in England and was made a Second Lieutenant in the 92nd Howitzer Brigade of the Imperial Army. He had only been in Europe about six weeks.

O. A. C. BANQUET IN LONDON.

Early in May, a few O. A. C. men in training in London, decided to collect what College men they could find in London to spend an evening together to talk over old times.

The result surprised even the originators of the idea, for at 7:30 p.m., on May 16th, no less than thirty O. A. C. men sat down to dinner in the grill room of the Tecumseh House.

Many were in uniform and represented various local units.

There were graduates of '11 and Freshmen of '19, but though many met for the first time that evening, every one knew every one else in five minutes because of that little-understood feeling known as "College Spirit."

After a dinner enlivened by reminiscences of track and lecture-room, football and lab, the toastmaster, Lieut. E. G. Rowley, of '17, proposed the Toast to the King.

Following this came "Alma Mater," proposed by Sgt. Dick Sands, of '15, and responded to by Purdom Love, of '16.

The toast to "The Ladies," especially those "across the car track," was drunk most heartily at the proposal of Bob Hinman, of '15, being responded to by "Pat" Finn, of '15, both of whom had been selected because of their evident interest in the subject.

"The 56th Battery, C. F. A." taken care of by Sgt. Jack Bird, of '17, and McAdam, of '18, was honored in the genuine way which showed how much we think of the College unit. The toast to "The Ex-Students" brought I. B. Whale, of '11, and R. H. McEwen, of '16, to their feet, while the last, "To Agriculture," was proposed and responded to by David McEwen, of '18, and W. H. Porter, of '11, who voiced the feeling of the civilians present in wishing the soldier students good luck and a safe return to a prosperous country.

Those present were: I. B. Whale, '11; W. H. Porter, '11; Major C. B. Nourse, '14—168th Batt. (P.P.C.L.I.); Pte. R. B. Hinman, '15, 2nd Field Amb.; Sgt. D. R. Sands, '15, 2nd Field Amb.; Lieut. M. T. Smith, '15, 99th Batt.; R. A. Finn, '15; E. G. Hogarth, '15; Sgt. R. Bryant, Chem. Dept. 153rd Batt. C. E. F.; Sgt. J. H. Light, '16, 2nd Field Amb. Sgt. C. C. Duncan, '16, 56th Batty, C. F. A.; Br. H. F. Rowland, '16, 56th

Batty C. F. A.; R. McEwan, '16; R. J. Bryden, '16; F. Farncombe, '16; B. P. Gandier, '16; P. F. Love, '16; Lieut. E. G. Rowley, '17, 153rd Batt. C. E. F.; Sgt. A. H. Cowan, '17, 2nd Field Amb.; Pte. R. G. Sutton, '17, 2nd Field Amb.; Sgt. W. G. Hill, '17, 56th Batty. C. F. A.; Sgt. J. Bird, '17, 56th Batty. C. F. A.; E. I. McLoughry, '17; L. Camp, '17; Br. D. C. McArthur, '18, 56th Batty. C. F. A.; Br. J. A. McAdam, '18, 56th Batty. C. F. A.; Sgt. R. W. Brown, '18, 56th Batty. C. F. A.; D. McEwan, '18; Lieut. D. Weld, '19, 7th Regt., London; Br. R. Hammersley, '19, 56th Batty. C. F. A.

MARRIAGES.

GOOD-WOODRUFFE.

The following is taken from the Truro (N. S.) Daily News:—

"Halifax, April 3.—Rev. C. J. Woodruffe, rector of Christ Church, Dartmouth, officiated at the marriage therein, at half-past six o'clock this morning, of his daughter, Helen Mary and Lieutenant Charles Atkinson Good, of the One Hundred and Ninety-third Battalion, mobilizing at Truro.

"The wedding was a very quiet one, the bride, who was given away by her brother, John C. Woodruffe, being unattended. She looked very girlish and lovely in her travelling gown and carrying a bouquet of white roses. The organist and choir were present, the musical details of the beautiful service being finely rendered."

Lieut. Good is a graduate of Class '14, and previous to his enlistment was on the Entomological staff of the Department of Agriculture, Nova Scotia.

Sincere hopes for a safe return and long and continued happiness, are extended by The Review.

BAIRD-BLACK.

On Saturday, April 29th, 1916, by

Rev. Dr. MacGillivray, Hazel Aileen, youngest daughter of Robert and the late Mrs. Black, to Alfred Briggs Baird, B.S.A., '16, of Fredericton, N. B., son of Isaac Baird, of Chipman, N.B.

Saturday, April 29th, seems to have been Baird's busy day:

9:00 a.m. to 12:00 m.—last exam.

12:30 to 2:30 p.m.—Graduation dinner.

3:00 p.m.—Wedding.

If Baird keeps up to this record, we predict a most brilliant and successful career.

The best wishes of all the College boys, for a happy wedded life, are extended to Mr. and Mrs. Baird.

APPOINTMENTS.

The many friends of N. S. Golding, '14, will be interested in hearing of his recent promotion in the military world, in England. He is now a Lieutenant in the 1st London Sanitary Co. attached to the R. A. M. C. of the British Army Territorial Forces.

A little over a year ago Lieut. Golding joined the ranks of the 36th Battalion at Hamilton, and after several weeks' training at Niagara, went over seas, and during the summer months was in camp at Shorncliffe. He is now at the Duke of York's Headquarters, Chelsea.

The following is an extract from a letter recently received from him:

"The officers here are a very nice lot of men, mostly medical, and all have some College degree. The work we do is in various lines of army sanitation, the eradication of lice, the disposal of garbage, and the care of the water supply."

Mr. G. G. Bramhill, B.S.A., has been appointed as special flax expert under the Agricultural Department at a salary of \$1,800.00 per annum.

His duties will be to familiarize him-

self with the whole flax question in Canada and carry on investigation in connection with fibre production and the utilization of flax straw for industrial purposes.

Mr. Bramhill, previous to his appointment in this capacity, has been the District Representative for Lambton County and has had considerable experience in flax production in Canada.

WORD FROM ENGLISH CAMPS.

The following card was received recently from Russel Peart, of '16, who is at present in training in England:

"May 7, 1916.

"Dear ———:

"Here's a line, hoping you are progressing favorably, and that everything is going all right in Guelph. This country is quite different from Canada. There is always something new to see all the time. Remember me to everybody, from

PTE. R. M. PEART, No. 527630,
C. A. M. C. F. S. Dibgak Camp
Shorncliffe, Kent, England."

The letter published below was re-

cently received from G. L. Smith, of '17, intimating the appreciation of the O. A. C. boys over seas for news from the College. As there are quite a number of O. A. C. men over seas, whose addresses we do not know, we would be pleased to receive these addresses that we may send The Review to them regularly.

Wetley Camp, May 8, 1916.

Dear J. C.:—

Would it be troubling you too much to have my address for the "O. A. C. Review" changed to the one following?

There are several O. A. C. boys in the Battery, and the way they eat up any news from the old College would make you feel like doubling your magazine's circulation for the benefit of the students overseas.

If I can scrape up the time would like to send you stuff from here, or perhaps some pictures.

Gunner Gordon Lindsay Smith,
No. 307745, 43rd Battery, C. F. A.,
11th Howitzer Brigade, Canadian
Contingent, British Expeditionary
Force, Army Post Office,
London, England.

College Life

MEDALS, SCHOLARSHIPS AND PRIZES AWARDED, APRIL, 1916

GOVERNOR GENERAL'S SILVER MEDAL.

(General Proficiency, First and Second Year work)—J. A. Bremner, Ethel Ont.

GEORGE CHAPMAN SCHOLARSHIP. (\$20.00 in books)—A. T. Brown, R.R. 9, Peterborough, Ont.

PRIZES OF \$10.00 IN BOOKS. (Best Second Year Essay on Assigned Subject)—G. E. DeLong, Rossmore, Ont.

(First in General Proficiency, First and Second Years)—J. A. Bremner, Ethel Ont.

SCHOLARSHIPS OF \$20.00 EACH, AWARDED ON FIRST YEAR WORK.

Group I.—J. M. Shales, Perth Rd., Ont.

Group II.—D. Hart, R. R. 3, Woodstock, Ont.

Group III.—C. A. Campbell, R. R. 1, Marshville, Ont.

Group IV.—G. Grant, Port of Spain, Trinidad, B.W.I.

CANADA INDUSTRIAL SCHOLARSHIPS.

- 1st—J. H. McCulloch, Kirkcudbrightshire, Scotland.
 2nd—V. C. Lowell, 113, 4th Ave., Ottawa, Ont.
 3rd—J. M. Shales, Perth Rd., Ont.

AGRICULTURAL OPTION.

- Abraham, R. H.
 Binkley, H. V.
 Brownridge, J. W.—*French*.
 Brydon, R. J.
 Chisholm, W. M.
 Coke, J.
 Coughlan, M. H.
 Dougherty, J. L.
 Glavin, J. G.
 Griffin, R. J.—*French*.
 Hill, W. H.—*French*.
 Hogan, E.
 Langley, B.
 Macdonald, W. P.
 McCulloch, J. H.
 McDermott, A. M.
 MacIntosh, J. M.
 McLarty, J. E.
 Schuyler, D. R.
 Scott, W. H.
 Shaw, W. R.
 Small, E. L.
 Stothers, S. B.
 Strong, W.

CHEMISTRY AND PHYSICS OPTION.

- Archibald, J. G.
 Ferguson, C. D.
 Foulds, F. E.

BIOLOGY OPTION.

- Atkins, E. W.
 Baird, A. B.

HORTICULTURE OPTION.

- Culp, E.
 Reilly, E. E.

DAIRY OPTION.

- Lackner, C. E.
 Skelton, R. J.

ENLISTED.

- Amos, L.
 Bennett, W.

- Burrows, A. R.
 Carncross, E. E.
 Clark, G. A.
 Duncan, C. C.
 French, H. S.
 Jackson, G.
 Johnston, J. T.
 Martin, N. R.
 McLennan, D. M.
 Romyn, A. E.
 Varey, J. M.
 Welton, K. W.
 Walsh, F. W.
 Wilson, J. R.

YEAR STANDING—APRIL, 1916.

Maximum—2400.

1. White.....	1891
2. Austin.....	1790
3. Mason.....	1780
4. Slack.....	1752
5. Evans.....	1742
6. Davey.....	1740
7. Schurman.....	1726
8. Guild.....	1726
9. Wiggins.....	1709
10. Murdock.....	1672
11. Sutton.....	1663
12. Manton.....	1661
13. Van Every.....	1657
14. Selwyn.....	1641
15. McKillican.....	1622
16. Clark.....	1606
17. Martin.....	1604
18. Neff.....	1571
19. Waterman.....	1537
20. Stokes.....	1533
21. Redmond.....	1507
22. Marritt.....	1496
23. Fleming.....	1461
24. Hunter.....	1452
25. McConkey.....	1452
26. Skinner.....	1442
27. Merkley.....	1318
28. McCurry.....	1256 * 7, 11

LIST OF SUBJECTS.

1. English Literature.
2. Composition.

3. Public Speaking.	28. Michael.....	1991
4. Economics.	29. Halsey.....	1959 *22
5. French.	30. Shorey.....	1953 *22
6. Heat.	31. McLeod.....	1949
7. Meteorology.	32. Hoard.....	1946
8. Cold Storage and Ventilation.	E. 33. Smith.....	1942
9. Inorganic Chemistry.	34. Hamilton.....	1935
10. Qualitative Chemistry.	35. Knowles.....	1925
11. Quantitative Chemistry.	36. McBeath.....	1922
12. Organic Chemistry.	37. Wallace.....	1837
13. Geology.	38. Scott.....	1828 * 8
14. Crypt. Botany.	39. Walker, J. L.....	1821 *18
15. Plant Physiology.	40. Hawley.....	1795
16. Syst. Entomology.	41. Finch.....	1765
17. Economic Entomology.	42. Lambert.....	1750
18. Bacteriology.	43. Lavis.....	1740
	44. Richards.....	1722
	E. 45. Moore.....	1670 *22
	E. 46. Shaw.....	1647

* Indicates subjects on which pass standing was not secured.

YEAR STANDING—APRIL, 1916.

Maximum—3200.

1. Cooper.....	2381
2. Logan.....	2381
3. Bremner.....	2379
4. Brown.....	2353
5. Snyder, E. S.....	2349
6. Heimpel.....	2341
7. Ferguson.....	2328
8. Arnold.....	2300
9. James.....	2292
10. Patterson.....	2266
11. Andrew.....	2365
12. McEwan.....	2230
13. Malyon.....	2229
14. Wilson.....	2228
15. Sullivan.....	2222
16. Snyder, A. W.....	2186
17. Newton.....	2155
18. Lowell.....	2137
19. Jakes.....	2123
20. DeLong.....	2116
21. Walker, C. V.....	2112
22. Dodding.....	2101
23. Parfitt.....	2051
24. Robinson.....	2030
25. McCulloch.....	2019
26. Nelson.....	2003
27. Munroe.....	1992 *18

E. Indicates less than 60% in English.

* Indicates subjects on which pass standing was not obtained.

YEAR STANDING—APRIL, 1916.

Maximum—2500.

1. Shales.....	2027
2. Campbell.....	1924
3. Hart.....	1923
4. Flatt.....	1895
5. Grant.....	1868
6. Musgrave.....	1856
7. Odell.....	1784
8. Munroe.....	1758
9. Gunn.....	1734
10. Gowland.....	1728
11. Barbar.....	1671
12. Kimball.....	1640
13. Oliver.....	1611
14. Matheson.....	1608
15. Steckle.....	1603
16. Hardy.....	1584
17. Bateson.....	1568
18. Hodgins.....	1559
19. Caldwell, W. C.....	1523
20. Hunter.....	1515 *12
21. Mason.....	1514
22. Shield.....	1509

23. Surgenor	1506	55. McLean	1166
24. McKay	1479	56. Tice	1154 * 4, 12
25. Toole	1477	57. Cook	1151
26. Scouten	1461 *13	58. Mills	1092 *10, 13
27. Kezar	1455	59. Duff	1080 * 1, 12
28. Goudie	1453 *11	60. Wood	1078 * 8, 10
29. Way	1434	61. McDonald	1077 * 6, 12
30. Pearsall	1422	62. Hale	1070 *10, 12
31. Atkin, R.	1419	63. Carr	1027 * 1, 9
32. Stewart	1401		
33. Aylsworth	1394		
34. Stillwell	1383		
35. Peters	1380		
36. Delamore	1373		
37. Higgins	1366		
38. Ziegler	1366 *13		
39. Minielly	1325 *12		
40. James	1323 *11		
41. Crews	1315		
42. Moore	1312 *12		
43. Sibbick	1291		
44. Allan	1288 *12, 20		
45. Wadsworth	1269		
46. Patterson	1267		
47. Secord	1260		
48. Karn, F. P.	1255 *13		
49. Rutter	1253 * 6, 12		
50. Argue	1231 * 9		
51. Andress	1224 *12		
52. Jackson	1201		
53. Costogoe	1185 * 1, 13		
54. Raymond	1173 * 8, 12		

LIST OF SUBJECTS.

1. English Literature.
 2. Composition.
 3. Arithmetic and Drainage.
 4. Bookkeeping.
 5. Hydrostics.
 6. Soil Physics.
 7. Mechanics.
 8. Manual Training.
 9. Chemistry.
 10. Geology.
 11. Botany.
 12. Zoology.
 13. Horticulture.
 14. Field Husbandry.
 15. Animal Husbandry.
 16. Dairying.
 17. Poultry.
 18. Apiculture.
 19. Vet. Anatomy.
 20. Vet. Materia Medica.
- * Indicates subjects on which passing was not obtained.



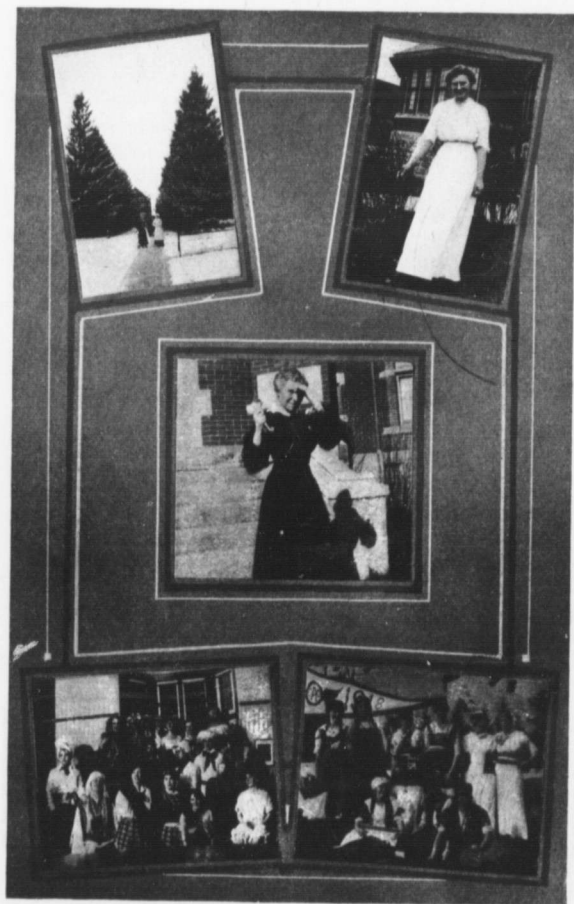
THE PROPHET SPEAKS—CLASS '16 IN
THE YEARS TO COME.

"For I dipt into the future—
Far as human eye could see—"

In the year 1930 A.D., Miss Watson
nally decides that she will lay down

the reins of power. She advertises
widely for a substitute, preferably a
graduate of Class '16, but, receiving
only meagre replies, decides that she
will visit the girls personally.

Accordingly on a sunny May day



AIDS TO PLEASANT REMINISCENCE.

she enters her biplane and bids her aviator direct her to Toronto. There we see her entering the office of the huge University dining hall, where she greets a tall, distinguished looking woman — Edith Hopkins — just as we think. But when the subject of "change in position" is broached the whole University rises up in arms, declaring that they can not and will not part with Miss Hopkins. They have evidently discovered her to be the same old reliable that the '16 Students' Council found her to be.

Passing over a park Miss Watson notices a large crowd assembled—large streamers float in the breeze announcing "Better Babies' Contest." On nearer approach she perceives the following proud exhibitors—Mrs. Mabel Llabmur, Mrs. Eleanor Reppoh, Mrs. Nellie Silew, Mrs. Marguerite Trawets, Mrs. Freda Edisnerg, Mrs. Nettie Nosredneh and Mrs. Alice Yarrum. On the judge's decision of 99.9 in favor of Mrs. Eleanor Reppoh, who had the most successfully applied Holt's principles as interpreted by Miss Watson, the latter announces her intention of presenting a silver cup to the winner. Hurrah for Hop!

Early the same evening as she is reading the paper Miss Watson is startled by the following announcement:—"Women! You are invited to attend a mass meeting to-night in Massey Hall to commemorate the 10th anniversary of Woman Suffrage in Canada." Reading further she decides to attend since she discovers the following familiar names among the speakers of the evening:

Presiding Officer—Miss Marjorie Williams.

Western Representative—Miss Beatrice Watson.

Nova Scotia Representative—Miss Mary Moxon.

Hudson Bay Representative—Miss Eleanor Smith.

English Representative— Mrs. Alfred Cleeves, nee Janet Story.

Foreign Representative—Miss Lillian Macdonald.

Local Representatives—Misses Helen Easton, Florence Shannon, Edith Scott, Chryssa Black, Marian Dunbar, Grace Moyer.

The various speech prove highly interesting to Miss Watson, but we are sorry to say that Miss Eleanor Smith was unable to be present, owing to the difficulty in getting out of the Hudson Bay region. The enthusiasm revealed in the various speeches carries Miss Watson back to room 47 where various dietetics lectures were held in '16. So enthused are the girls in their suffrage work that even the honorary position offered them by Miss Watson can not lure them away from Woman Suffrage duties.

Enquiring for Kathleen Stevenson and Frankie Allan, our traveller learns that they are holding forth in a prosperous little tea-room—Macdonald Inn—on Yonge Street. But it is when she visits the home for invalid soldiers that Miss Watson is really proud of her "old girls." Here she finds Jessie Hall installed as housekeeper, Florence Reek as dietician and Jean McIlquham as Pollyana making glad the hearts of our brave soldiers with her cheery songs.

As a last resort our heroine decides to visit Gwen Ramage, who is now teaching sewing in Columbia University, with little hope of success, however, for since their giddy days at Macdonald Hall the girls have learned the value of Mr. Lucre. In passing through Belleville Miss Watson visits the "Deaf and Dumb" Institute, where she is greeted effusively by the matron, Miss Kate Percy. To her astonishment she

finds that Miss Percy has become so enamored with the peace and quiet of this home that she refuses to be enticed back to Macdonald Hall. When crossing the border at Niagara Falls Miss Watson is greeted with "Open your baggage for inspection, Madam," from a portly official and lo, and behold! here is Lord John Monitor, Nannie Scott. Well, well, well, the nightly terror of the Juniors transformed into a blooming customs official. Our little lady next finds herself confronted by a tall, distinguished looking immigration officer, Frances Beven, no less. After duly answering all necessary queries Miss Watson wings her way to Columbia where she finds Gwen quite willing—eager in fact—to fill the vacant position for you know what has happened to Miss McClellan, well, may be—

"COSMOPOLITAN SCHOOL."

The school bell rang at six o'clock, and one by one came the ragamuffins from all parts of the playgrounds. Sis Hopkins, the Campbell kids and Katzenjammers were the first to get in line. Then came Irish, Dutch, Scotch, Mexican and Turkish kiddies, even Topsy and Sloppy Susie from the slums.

Several of the trustees and teachers ushered them up to the school-room, where they were sternly ordered on their knees, and made to stay in this position.

Mr. Simon Peter, the principal of the school, then, called the roll. Every one was present, but Pearl Oyster-Stewart forgot to answer to her name.

Miss Tearly Titzen King conducted the gym class, and the ambitious little pupils put their best foot foremost, and gave an excellent demonstration of doing a little physical exertion. These children then took their seats on their knees, and Miss Spelling-on-wrong gave

her children a short but illuminating lesson in spelling. The teacher was very humiliated because even Hazel Golden Brown couldn't spell m-a-d backward. The teacher found that though their faces were bright the children's mind swere dull and rather a blank.

Madam Madonna, the eminent vocalist, showed her class to great advantage in chorus singing. Their rendering of:—"We are the freshest little freshies ever were," was quite a triumph in sight reading, and the Board of Directors were quite pleased at the children's untiring efforts to keep out of tune.

School was dismissed and the dignified and quiet Juniors forced the poor unfortunate freshies to bow down with deep reverence, around the table holding the sacred emblems of the future life in "Mac Hall," and to say with deep feeling the following words:—

"We the freshies of the April class, on bended knees and up-lifted feet do swear, by the fish eyes and goo, by the hard-boiled eggs and honey, to be faithful and true to the Junior Associates, Home Maker B's, to Students' Council and Mrs. Fuller."

Thus ended the initiation of the April class of 1916.

THE BATTERY DANCE.

The members of the 56th O. S. Battery will carry with them many memories of happy evenings spent in "The Hall" but none will be more happy nor vivid than those of the Battery dance on April 14th.

The wide hospitable halls, the brightly lighted gym, the attractive dining-room where fair maidens combined to make a picture not soon to be forgotten.

And the programme! Who can say that the programme did not sound as enticing as it looked? The rousing

"Battery Bang" the conquid "Wawta Waltz," the alluring "New Girl's Hesitation," all had their charms—but nothing in the whole evening could hope to equal the call of the supper dances—the "Dining Hall Dash," and the "Fuller Waltz"—

There is an old saying, "The way to a man's heart"—and no one can tell how many hearts were found (and lost) during the night of, what will be for many of us, the last dance in the Hall.

The Battery Boys—God bless them—have a place all their own in the hearts of the Mac Hall girls, and if good wishes will bring them back they will all be home again safe and well before many moons have come and gone.—*F.B.*

MACDONALD LOCALS.

Stranger—"What kind of a town is Guelph?"

Native—"A college town."

Stranger—"What do the people do who do not attend college?"

Native—"They do the students."

Dr. Stewart—"Are you ill? Let me see your tongue, please."

Patient—"It's no use—no tongue can tell how bad I feel."

Dr. Stewart—"You have a high fever?"

Miss Mac—"Yes, and a dreadful headache."

Dr. Stewart—"You have a complicated case of appendicitis."

Miss Mac—"Impossible—my appendix was removed four years ago."

Miss Roddick—"Why does fat rise to the top of soap?"

Brilliant Homemake—"So it can be skimmed off."

Miss R.—"How do you tell a bad egg?"

Junior—"If you have anything really important to tell a bad egg, why break it gently."

Mary Moxon—(wading through the fishworms after Tuesday's storm, gazing heavenward)—"Where do those worms come from anyway?"

A darn may be a species of strong language, but it's a darn hard thing to define.

We notice that Kay has not yet removed the bristles from his upper lip. Well, we suppose that no one has noticed it there.

Mr. Fulmer—"Name a bi-product of coal."

Edith O'Flynn—"Coke."

AT PARTING

Although the strings are muted now,

And low and minor the refrain,

And all the lilting notes submerged,

In wistful parting notes of pain—

Full glad and strong a symphony

Of hope and courage steals its way,

Until in true interpreting

The purest music holds the sway.

Past joys and sweet rememberings;

True friendship, golden years of gain;

All this to keep, and this to prove

The days have not been lived in vain.



AT COLLEGE.

"How is Robert getting on at college?" asked the minister, who was being entertained at dinner.

"Splendidly," said the proud father, who then went on to tell of his son's various social, athletic and scholastic successes, and the minister said it was a fine thing to be college bred.

That evening little James, who had been an interested listener, said, "Papa, what did Mr. Brown mean by college bred?"

"Oh, that," said papa, who had been looking over his son's bills, "is a four years' loaf."

CONSCIENTIOUS PETE.

Buffalo Jones was telling an after-dinner story:

"Pete had charge of the animal tent, and among his pets was a leopard, the only one with the show. He was a bad leopard too, and gave Pete far more trouble than all the rest of the menagerie together. One day, when the show was in New Jersey, I went out to Chicago to arrange some business. While I was having dinner a telegram was handed me, it read:

"The leopard has escaped. Prowling about the town. What shall I do?"

"PETE."

"Pete was one of those fellows who had to have explicit directions to do anything, even in an emergency. He was always afraid of making a mistake. I rushed from the table and sent a reply.

"Shoot him on the spot," I wired. Being unusually busy, I forgot all

about the affair until about two hours later, when I returned to the hotel, and another telegram was handed me. It proved to be from careful, conscientious Pete, and asked:

"Which spot?"

STRATEGY.

¶London is excited
 ¶Also a little worried
 ¶About something.
 ¶The German Emperor
 ¶Is dee-lighted
 ¶Just like Roosevelt
 ¶Because he believes
 ¶That foggy old London
 ¶Is frightened
 ¶Of Zeppelins.
 ¶We know better
 ¶And just this once
 ¶We will divulge
 ¶A state secret
 ¶And tell the real cause
 ¶Of London's anxiety
 ¶At the present time.
 ¶Everybody is afraid
 ¶That General Sam Hughes
 ¶Is going back to England
 ¶To fire Robertson
 ¶And General French
 ¶And Admiral Jellicoe
 ¶Or make a speech
 ¶Or perhaps two or three.
 ¶You can't blame them
 ¶For being worried.
 ¶But the poor old Kaiser
 ¶Thinks his Zeppelins
 ¶Have done it.
 ¶All of which proves
 ¶Strategy, my boy,
 ¶Strategy.

A Bad Name for a Good Plant

The Ancients Called it a "Wolf" but it Is Really a "Sheep."

By H. A. Bereman.

Growing in sandy places in many parts of the world is a plant bearing spikes of bluish-white flowers—an attractive plant that arrests the attention of the passerby. The flowers mass gorgeously when clustered thickly on fertile lands. It grows in the almost pure sand of the high dunes which skirt the eastern shores of Lake Michigan. This plant is known as *Lupinus perennis* and both name and habits afford an interesting example of how the real nature of vegetable forms is often misunderstood in the light of that "little learning" which Pope called a "dangerous thing."

The old Latins named this plant from the word "lupus," meaning a "wolf." In those days, when scientific agriculture was undreamed of, it was believed that wherever such plants grew they desolated the soil by devouring its elements of fertility. Hence this plant was to them a weed more noxious than those which merely compete with cultivated crops for light, moisture and sustenance.

In the present age of wide and exact research, science reveals the fact that the lupines belong to the botanical family leguminosae, one of the most interesting and agriculturally the most important group of plants known to man. To this family belong the clovers, peas, beans, vetch, alfalfa, and scores of less popular species, many of them wild things which possess no commercial value.

The economical value of the above forage products is well known, but the entire family of legumes has a peculiar faculty of placing them in the front rank of agencies which help to make this

world habitable. On the roots of these plants nodules appear—some almost microscopic, and some as large as a pea. These are colonies of bacteria parasites in form only, because they "work for nothing and board themselves." They possess the unique property of taking the free nitrogen of the air and thru the organic chemistry of their life processes they convert this gas into nitrates, an essential food for all plants.

These bacteria are microscopic plants propagating by dividing into two pieces, each half growing into a full sized bacterium. These "germs" exist naturally in many soils, often remaining dormant for years awaiting the arrival of their hospitable legume laboratory to start up in active business. Where they are deficient, legumes will not thrive and the land is said by old farmers to be "clover-sick." To correct this condition the soil must be inoculated with this species of bacteria. The simplest way is to scatter on the land a bushel to the acre of soil from an old clover field.

As acid is antiseptic or deadly to bacterial life, the legumes do not thrive in what is called "sour soils." The acidity may be neutralized by applying ground limestone (calcium) to the land, after which inoculation will be necessary to start bacterial nodules at their work of absorbing atmospheric nitrogen.

The nitrates thus produced by the friendly bacteria is a soluble form of the chemical element nitrogen, in which form it is "fixed" or more or less permanent as a solid, a portion being appropriated by the host plant for its

own development. Both foliage and seeds of the legumes are rich in a digestible form of nitrogen known as "legumin." When eaten by animals this is assimilated in the formation of albumen, lean meat, the casein or cheese principle in milk, nerve tissues, hoofs, horns, hide and hair. No animal could live without this element in its food, for it is the only chemical course of tissue repair.

When the roots and stubble of clover are plowed under they decompose and their nitrates become incorporated with the soil. A soil thus enriched produces a heavy growth of dark green foliage in all crops that may be planted therein.

Ten chemical elements are necessary for the growth of all agricultural plants. Economically they may be grouped as follows: "Oxygen, carbon and hydrogen are obtained in unlimited quantities from air and water; potassium, magnesium, iron and sulphur are found plentifully in most normal soils—enough to last for hundreds of years; calcium is plentiful in most soils, but poorly drained lands and those naturally deficient in lime become sour and need the artificial addition of calcium; phosphorus and nitrogen are limited in nearly all soils. Phosphorus is soon exhausted by heavy cropping and in a system of profitable farming must be replaced by applying to the land bone-meal, acid-phosphate and rock-phosphate.

As nitrogen is essential to the growth of plants as well as animals, the securing of this element is of vital importance in agriculture. Indeed, nitrogen is the limiting element in most soils, the exception being muck or swamp soils containing large amounts of decaying vegetation.

Ordinarily the problem of securing large yields of grain, vegetables and other farm products is one of supplying enough nitrogen. This is why the thrifty farmer includes clover, cow-peas, soy-beans, etc., in his system of crop rotation. If he is wise he will plow under a legume crop in full bloom at least once in four years, besides returning all the stable and barnyard wastes to the fields in order that their productive power may not be impaired.

Wild legumes add fertility to the soil in similar fashion by their yearly deposits of dead roots and branches.

From all these facts it is seen that instead of the lupine being a "wolf" or a "tare" it is one of Nature's happiest gifts to man. Without this tribe of nitrogen gatherers there could be no human life nor other life on the globe. Thru this knowledge it is easy to maintain the soil as a permanently productive asset, not as a natural resource, but as a "factory" for the conversion of crude materials into finished food products.

—Farming Business.

