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MISSING

THE O. A. C. REVIEW

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

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Rural Education

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AT the meeting of the Ontario Experimental Union held at the O.A.C. a few weeks ago the opinion was unanimous that, notwithstanding the insistent cry for increased food production to meet the demands of war conditions, the area of tilled land in Ontario this year will be less than that of former years. One prominent farmer said, "I went to Toronto as a last resort, to try to secure hired help and I offered as high wages as the munition factories. There were plenty of able-bodied men walking the streets but they, one and all, declared they would not go to work on a farm no matter what happened. Most of them said they knew nothing about farm work or farm machinery, and I concluded that they would be of but little assistance if they did come. I wish we could get some foreign labor. It was getting worse and worse before the war, but it has reached the limit now. There seems no alternative but to cut down the work and do it all ourselves."

A situation that compels an honest and well informed citizen to arrive at such a conclusion, challenges immediate attention. No patriotic Canadian can view with complacency the prospect of landlordism, foreign labour and denationalization as our final goal. The time has come when a wiser solution of the Ontario rural problem must be found.

As a result of years of first hand,

experience of our rural conditions and an extended study and observation of reforms that are being introduced in Canada, the United States and Europe, I am convinced that the application of a few practical, fundamental principles would result in placing five times as many persons on the land as at present, and would enable them to live in a state of comfort and well-being now enjoyed by but few Canadian farmers.

The first of these principles is that any vital and enduring reconstruction of rural conditions must be made through education. Ontario possesses unrivalled natural agricultural resources. Her children are well born and well nurtured, and with the heritage of British institutions she enjoys a liberty for which our soldiers are, today, voluntarily laying down their lives. With such satisfactory materials to work upon, there is a kind of education which, if applied, would act as a powerful solvent for the rural, economic, social, moral and religious problems, which are confronting us.

In the next place, we must adopt as a working principle, the fact that "life is more than meat and the body than raiment." Meat and raiment are prime necessities, but it is not for lack of either of these that most people leave the farm. Many centuries ago, Aristotle pointed out that the chief aim of every human being is happiness and that there are many

kinds of happiness, some much superior to others. From the multimillionaire, like Carnegie, to the poorest individual on the street, there is, on every hand, a rapidly growing conviction that the prayer "Give me neither poverty nor riches" contains the essential truth of economic well-being. The aim to be kept in mind in the country home is not the happiness of the millionaire but of the man who lives a complete life, physical, mental, moral, spiritual, for himself and for those with whom he comes in contact.

Further, the course of study should be so selected and arranged as to prepare for such efficient citizenship. The education given should be of a character to prepare every man and woman to subsist by his or her unaided efforts if placed alone on the land. This would mean a primitive working knowledge of agriculture, housebuilding, cooking, sewing and housekeeping. I once heard a prominent Canadian say "the most miserable day I ever spent was as a boy of sixteen on the farm. I drove from house to house trying in vain to find a girl to hire. Money was not the consideration. No one was willing to come to work in a farm house where there was a family of five boys, no girls, and a worn out mother, no matter how respectable or well to do the family might be. I came home completely discouraged and turned in and helped with the housework as best I could, without any training, but I took good care that the neighbors did not find it out and label me a "molly-coddle." I also registered a vow to leave the farm for the city on the first opportunity, a vow which I promptly performed."

After a somewhat extended experience with classes of boys and girls and of men and women, my opinion is that there is no such difference in the

natural desires and aptitudes or in the physical or mental powers of boys and girls as is commonly supposed. In the Chicago University Elementary School, the boys and girls learned side by side, to cook meals, wash dishes, plane boards, and raise vegetables with apparent equality of satisfaction and progress. In France, I found the man chef in the hotel and the peasant woman in the field—both doing excellent work and enjoying it—a power, which, incidentally, when war came, proved the salvation of France.

Nor is there great difference in the physical strength required for indoor and outdoor work on the farm. Driving horses and running machinery are both lighter forms of manual labor than much indoor work that might be named. The exigencies of the war have rendered it necessary for the brave men in the trenches and the army of noble women, who are taking their places at home to engage in many forms of activity, hitherto considered suitable only for the opposite sex. The results have proved highly satisfactory but they would have been much more so if all of our people had had the great advantage of a brief preliminary training such as is given in the short courses at the O.A.C.

The best educational thought of our time has arrived at the conclusion that for proper development, every normal child over seven years of age should have, each day, an hour of hand work of a kind suited to his natural aptitude and strength, work that needs doing and appeals to the child as worth while. The time should be gradually lengthened with each succeeding year. From both the individual and national standpoints, it is necessary that the subjects to which I have referred (Agriculture, etc.) be incorporated in the school course.

By careful correlation of studies, adequate school conditions, and properly trained teachers, this can be done, without interfering with the progress made in the "three R's" which must always remain essential in a good education.

For the present situation, probably the best condition is that of a rural consolidated school of two rooms, with farm and home attachment, with a male teacher who has had academic, agricultural, and professional training, and a female teacher who has substituted Household Science for Agriculture in a similar preparatory course. With such an arrangement much of the work of farm and home could be performed by the pupils.

Finally, the preparation of the Rural School Teacher; (and of the clergyman as well), should be different from that of the city. In the Ottawa Normal School I had opportunity to observe the beneficial effects on the teacher in training for Rural Schools,

or even a few hours spent, each week, at the Dominion Experimental Farm. I also found at Macdonald College, where the students were placed in a constant farm environment and in the hands of a staff, many of whom were specialists in Agriculture and Household Science, that the students from the country, by open vote at the conclusion of each year, expressed a preference to return to the country to teach rather than go to city schools.

There are great possibilities in a residential rural Training School for Rural School Teachers—a school with farm and home equipment and ideal country atmosphere and with a number of Agriculture and Household experts on the teaching staff. It would be a great advantage to such a school to be situated near an experimental farm or Agricultural College, for in the ultimate analysis, the thing most to be desired is a cumulative, community enthusiasm for all that is best in country life.

The Church and Country Life

BY ALEX. MACLAREN, B.S.A.

THE Business of the church is to preach the "Gospel." If you were to ask the average clergyman today the question, "What is the business of the church?" the above would be the answer. There is objection to such an answer—it is to the average interpretation of its meaning and what it involves that objection is often taken. If the answer means that the church's business is done when one or two preaching services are held each Sunday and prayer meeting on Wednesday evening then we must disagree.

The business of the church is to bring to pass the establishment of the Kingdom of God on this earth. Such an achievement can never be attained by simply preaching. The establishment of such a kingdom means the application of all the principles taught by the lip of Jesus to a l of the ways of man in both individual and social life and relationships. Such a program demands a very broad and comprehensive plan of work and seems to be naturally divided into three separate divisions viz., (1) Preaching; (2) Teaching and (3) Living or Demonstrating

the Christian principles in their application to every day affairs of living. In other words we must make our religion our life here on earth and not a life we live up in the clouds with all our efforts directed towards preparation for the world to come.

Under preaching will come the setting up of ideals for life in its various aspects and relations. Here the church will find its opportunity to appeal to the emotional and aesthetic nature of those who gather for worship. The preaching however will have to concern itself more with the every day things of life rather than old mediæval theological doctrines. Why should the church not idealize such a common every day affair as the farmer's flock of chickens or his herd of dairy cattle? Has he not been given these things by God to hold in stewardship for Him just as much as his own body, the destruction of which by drink we so much deplore and hold up as the breaking of God's law. We call the drunkard a sinner. Yet there are men who have been given farms, flocks, herds, etc., which they hold from year to year with very little if any improvement whatever. Are the laws which govern the conservation and upbuilding of soil crops and stock any less the laws of God than those governing our bodies or our relationship to our neighbors? The first thing the church will need in its preaching work is a larger conception of the Kingdom of God, a more comprehensive understanding of righteousness. We must come to realize that we are co-partners with God in farming. God meant us to produce the maximum in quantity and quality of produce. He ordained certain laws governing such production. In so far as we conform to those laws we are righteous, and when we break the laws, consciously or ignorantly, we

are unrighteous. With such conception of righteousness or the Kingdom there is no department of life into which the church must or may not enter. In fact modern conditions demand that the church hold up ideals and exhort men to live up to them in all phases of life. So we believe every church ought to have special days set apart throughout the year upon which various phases of life would be considered and ideals for their development set forth. These special occasions would include Home Day when such things as conveniences, recreation, home partnership, beautifying the surroundings, etc., and their relationship to the Kingdom of God would be considered and ideals set up. Other phases of community life for which room should be found in the years' work should be School, Community Life, Co-operation, Recreation, Sanitation, etc.

Thus this by kind of preaching people would be shown that Religion was a thing that was related to every day life and not something to theorize and vaporize about—something to incorporate in life and not something apart and of different nature.

Secondly the church will have to teach. The avenue for this work, of course, is mainly the Sunday School, although much may be done through the pulpit. Today in the majority of country churches we are playing with the job of teaching Christianity. The lesson material is ungraded and unadapted and we find inexperienced, ignorant teachers trying to teach the same lesson to pupils all the way from infants to gray-headed old men. One instance came to our notice of the teaching of the lesson of Moses' death. The teacher was trying to teach a class of boys the lesson of preparing for death when the boys involved were

so full of life that death was the last thing thought of. So we find teachers trying to teach children the doctrines of the Trinity, Atonement, etc., when the pupil's experience totally prohibits them from understanding such lessons. Our Sunday Schools must be properly graded, lesson material adopted, and truth taught rather than myth, superstition, tradition and fable. We must face courageously the fact that this is a questioning scientific age which demands that all branches of life must stand the close critical examination of searchers after truth. How many young men and women have gone astray in life when they discovered that in childhood they had been taught to rely on something that later proved to be untrue.

Thirdly, the church will have to look upon itself not as a select group to be set apart from the rest of the world, waiting and longing for the second coming and selfishly tending their own interests. It must be thought of as an army which attacks evil in the community life and by its strength overcomes the evil and purifies the community life. For instance, take the question of recreation, if conditions are such that immoral practices have become connected with the prevalent forms of recreation in the community such as gambling, drinking, social impurity, etc., it is not sufficient to denounce such from the pulpit, we must substitute some-

thing better in its place and so eliminate the evil. If there is a Farmer's Club in the community which is carrying on business in a crooked manner it is from the church that the effort must be made to rectify the wrong. If there is no regular organized method of bringing the people of the community together to develop a community of spirit and action, the church must, if it wants Christianity to become operative in that community, see to it that opportunities are afforded for all classes, sexes, ages, denominations, creeds and colors to get together. Christianity after all is co-operation and brotherhood. A man cannot be an individualist and a true Christian. Individualism, owing to calling and conditions in country life, is the farmer's besetting sin. Its cure lies in multiplying the numbers of opportunities for getting together in community gatherings of various types,—social, physical, intellectual, economic, etc. This gathering together brings us face to face with one of the glaring sins of the church viz., absence of unity of spirit. The great number of divisions and weak struggling churches creates a division of social forces which stands blocking the path of progress of the country church. Union must be secured or there is great danger of the church losing its hold on country folk almost altogether. Until such unity or union is secured the church will have to struggle along very much handicapped in its work.



Preservation and Care of Foods on the Farm

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INTRODUCTION.

THE tendency of foods to perish under ordinary conditions is well illustrated by rotting fruits and vegetables, souring milk, decomposing meat and putrefying eggs. The necessity, however, of prolonging the period of usefulness of foods, together with the experience of centuries past, has taught men the value of drying of fruits, storing vegetables at low temperatures, boiling of milk and drying and salting of meat and fish, but left it to modern investigators to show clearly that micro-organisms are responsible for the spoiling of foods.

NATURE OF MICRO-ORGANISMS AND THEIR REQUIREMENTS FOR GROWTH.

Bacteria, yeasts and molds are plants microscopic in size. They are widely distributed in nature, since they have been found in soil, water, air, foods and intestines. Under favorable conditions they grow vigorously, increase rapidly in numbers and some of them produce undesirable changes in food products of vegetable and animal origin.

Micro-organisms have certain requirements for growth. They must have a sufficient and suitable food supply. Bacteria may grow readily in highly nitrogenous foods, like meat and fish, while yeasts and molds are likely to be found on highly carbonaceous materials, like fruits and vegetables. It must be mentioned in this connection that bacteria prefer a neutral or an alkaline re-action and that they are injured by light, while

yeasts and molds prefer an acid reaction and are not quite so susceptible to the effect of light. Next, micro-organisms must have a suitable amount of moisture (at least 25 per cent. for bacteria), otherwise, complete removal of moisture speedily destroys life. Then, micro-organisms must have a suitable temperature, though the range may vary for different types. Finally, they must have a suitable gaseous environment, because in some cases free, uncombined oxygen is needed for respiration and in other cases it may be utilized in its combined forms.

PRINCIPLES OF PRESERVATION OF FOODS AND THEIR APPLICATION.

Principles of preservation of foods, therefore, must be based either upon the complete destruction of the micro-organisms found in foods, or else upon the inhibition of their growth by creating unfavorable conditions. That these principles, as outlined below, are sound and workable is proved by the successful development of various industries handling and preserving perishable products. This, too, is a sufficient argument for their practical application on a smaller scale in the farm home.

One of the surest, oldest and best methods of food preservation utilizes high temperatures, such as 62 degrees C. for 30 minutes, which is used in commercial pasteurization of market milk, or such as sterilization at 110-120 degrees C. for 20 minutes, which is used in canning fruits, vegetables, meats and fish. High temperatures coagulate the cell protoplasm of micro-

organisms, and thus kill them, allowing the materials put up in hermetically sealed cans to keep indefinitely in a palatable condition.

The next method of conservation of food products makes use of low temperatures, such as in cooling milk to 50 degrees F. or lower, or such as in actually freezing meats in exporting them from Australia. Cold storage performs a useful service in carrying over supplies of food from periods of plenty to periods of scarcity and is most important for preserving meats, eggs and dairy products at about 32 degrees F. It must be remembered in this connection, though, that freezing cannot be relied upon to kill bacteria, that cold merely checks their activities, that low temperatures to be effective must be below 50 degrees F. and that, in case of meats, there is the danger of being stored after having become invaded by bacteria which might prove dangerous to the consumer.

The third method of increasing the keeping quality of foods depends on preservatives, which may be physical or chemical in nature. Of the physical preservatives commonly used there are sugar and salt, the effect of which in high concentration being that of extracting water from bacterial cells and thus checking their growth. This method finds its application in preserving fruits, jams and jellies; also in salting meats and fish, as well as in pickling of vegetables, such as cabbages and cucumbers.

Of the chemical preservatives there are those that become developed through the agency of desirable bacterial action, such as lactic acid in milk which holds putrefactive bacteria in check, and such as acetic acid in vinegar; also, there are those that are added, such as benzoic and salicylic acids. It must be noted, however,

that while added chemical preservatives do inhibit the growth of micro-organisms, they are poisonous and produce injurious effects on the gastrointestinal tract and interfere with the proper digestion, when taken in small amounts for any length of time.

The last method of preservation of foods to be considered here is that of drying, which is the oldest method known. Foods, relatively free from water keep almost indefinitely, but even foods with a moisture content below 25 or 30 per cent. furnish unfavorable conditions for bacterial growth. The removal of moisture may be accomplished by exposure in the sun or by hanging over the stove as in the case of mushrooms, by means of driers or evaporators as in the case of fruits, and by means of smoke as in the case of meats.

CARE OF FOODS.

When foods have been preserved either by destruction or inhibition of micro-organisms found on them, there still remains another problem, that of preventing their subsequent contamination. The possible sources of access of micro-organisms and their significance are brought out here and the remedy naturally lies in their elimination.

Unclean surroundings anywhere are a source of danger, but particularly so in rooms where foods are stored. Cleanliness is important for its own sake, but more so where foods are handled. Great help in this respect is found in the free use of water and soap, and in having cool, dry, well-aired, sunny rooms.

Dust, as such, is not welcomed in foods, especially when its make-up is better understood. It consists chiefly of small particles of soil and the adherent micro-organisms, dried man-

ure, powdered sputum, spores of molds and bacteria.

Flies play an important role as mechanical carriers of disease-germs. They are found in sputum from diseased lungs and throats. They breed in manure piles and refuse of all kinds. Their hairy feet and legs are actually loaded with different types of micro-organisms—many of which are likely to be living bacteria of disease—and these are left wherever flies land. Their presence is distinctly undesirable, to say the least.

Water may prove to be a source of

contamination of foods if it should become polluted. Germs of typhoid fever from feces may find their way into surface water and then into shallow wells. Water thus polluted and used in washing vegetables or fruit that are to be eaten raw is a sure source of danger to health. If the safety of the water is doubtful, it should be analyzed or else boiled.

Persons suffering from diphtheria or tuberculosis, etc., may spread the disease by coming in contact with food materials. Such conditions should not be tolerated.

Importance of Securing Vigorous Potato Seed Stock

(EXPERIMENTAL FARMS' NOTE.)

Experiments conducted at the Dominion Experimental Station, Kentville, N.S., with eight lots of Garnet Chili potatoes secured from different growers in 1915 show a variation in yield of from 36 bushels to 240 bushels per acre, or a difference of 204 bushels per acre in yield when grown under uniform conditions. Seed from these eight lots planted in 1916 yielded from 68 bushels to 212 bushels per acre, a difference of 144 bushels per acre. The respective positions of the different lots were changed very little in the second year, but the lowest yielding ones increased somewhat and the highest yield was not so great.

Seed from fifteen others of this variety was planted in 1916 and the lowest yield obtained was 158 bushels and the highest 278 bushels per acre, a difference in favour of the best over the poorest of 120 bushels per acre.

Ten lots of pure stock of Green Mountain from different growers rang-

ed from 180½ bushels per acre to 313 bushels per acre, a difference of 132½ bushels. Seventeen lots of Irish Cobbler ranged from 93 bushels per acre as the poorest to 235 bushels as the best, a difference in favour of the best yielding strain of 142 bushels. This would show that there may be as great a difference between potatoes of the same variety as there is between potatoes of different varieties, and that it is wise to secure stock from farms which have had high yielding crops. Because the Green Mountain has failed in giving a crop on a certain farm is not proof that this variety will not yield well there; it may have been due to low vitality in the seed stock. Such reversion in yield may have been due to disease, or adverse soil or climatic conditions which affected the crop at some time and it may be better to discard the stock entirely than to try to bring it up to its former vitality by selection.

Why Humdrum ?

BY LAURA E. NIXON '17.

"This world is so full of a number of things,
I'm sure we should all be as happy as kings."

—Robert Louis Stevenson.

Why is it that the people on farms,—and particularly the women—are so often discontented?

A well-known writer stated in "The Outlook" some time ago, "Nothing is wrong on the farm in this year of grace that cannot be righted by education."

Here, then, would seem to be the solution to a great problem.—Educate the people!

But how? Just what do we mean when we say "educate" them?

Our neighbours to the South have gone rather extensively into this matter. From the statistics they have gathered and the measures they have taken we can get many hints.

A few years ago the President of the U.S. instituted a commission for the betterment of farm life, by first investigating rural conditions. This commission brought to light many interesting facts but very little that applied to the home. The Good Housekeeping Magazine, realizing the inadequacy of the President's Commission, conducted a National Farm Home Inquiry. The work was later taken up by the greatest organization of women in the world. "The General Federation of Women's Clubs," with the result that they were enabled to get into touch with not only the farm homes of the U. S. but also those throughout the continent.

The first outcome of this movement was a collection of thousands of letters. In these letters the writers not only

described conditions in great detail but poured out their hearts in the expression of their needs, their ambitions and their dearest hopes. From these letters—some of which were published in "Good-Housekeeping"—one can get a better idea of rural conditions and rural problems than can be obtained even from personal observation for many things that would not be revealed to the most careful observer were brought to light. Naturally, these letters were extremely varied. They fell into two main classes. First, those from the more prosperous farms. In these the writers were disposed to regard any investigation into the status of farm people as an affront. A larger number came from homes where peace and plenty do not reign and in which the lot of the women particularly is a hard one.

The main points of these letters might be summed up as follows:

First.—The large amount of work to be done, with little or no help and few conveniences.

Second.—The monotony of life on the farm.

Third.—The lack of opportunity for social life.

Fourth.—The scarcity of money—or, as one woman puts it, "The Unpaid Work of the Farmer's Wife."

Having considered some of the causes for discontent let us notice what steps have been taken to remove it.

In New York State a Reading Course for the farm home has been established in connection with Cornell University. The courses for the farmers' wives deal with the chemistry of foods, sanitary conditions, how to work, how to rest, how to beautify the home inside and

out, and various other subjects of vital interest to everyone, yet, all subjects that have been almost entirely neglected by the busy woman in the farm home.

The object of these Reading Courses is to educate, to really lead the people out to larger spheres of thought away from the narrow circle of each day's work; to make their work enjoyable, not drudgery, and to help them to realize their advantages and make use of their opportunities.

But, we may say, the very people who need this most are the ones who have no time for reading. Just here a little story may serve to illustrate how much may be accomplished along this line with very little expenditure of time and effort.

There was once a woman, named Hepzibah, whose days were all alike,—grey days filled with work from early morn till late at night. A distant relative died and when her worldly possessions were divided a reproduction of Millet's, "The Angelus" was sent to Hepzibah. When the parcel came Hepzibah opened it with trembling fingers for an express parcel was an advent in her monotonous life. But when she saw the picture she was disappointed, not only disappointed but indignant. Why should they send this picture of all things, this picture of toilers to her whose days were filled with toil!

She put the picture in the attic and there it remained for many a day. In a time of vigorous housecleaning Hepzibah brought it to light again. She began to wonder why the artist had chosen such a homely subject for a painting. As she studied it and pondered she noticed that the two figures in the picture were in an attitude of prayer. She noticed also that it was early evening for the sky was still

tinged with the sunset glow. The thought came to her as she looked that these people in the midst of their toil had a few minutes in which their thoughts were taken from their work and centred on higher things. Why should not she!

That evening at sunset Hepzibah left her work and ran out to a hill near by to watch the sunset. It only took ten minutes of her precious time and she felt better afterwards. In the days that followed she lived through each day with the thought ever before her of the few minutes she would snatch at the close of the day in which she would forget her work and feast her soul on the beauties of nature and think the happy thoughts that were beginning to become a part of her life. In a very short time this woman's whole life and manner of living was changed and the atmosphere of that home was entirely different.

Even the busiest woman in the farm home can spare at least ten minutes out of the day to devote to some definite interest outside her daily work. The woman who does this will soon be planning and systematizing her work so that she can increase this ten minutes to half an hour or more.

Variety breeds content. Unhappiness is the child of monotony. It is the deadly monotony of the day's routine that is responsible for the discontent so prevalent in many rural communities. Yet, why should the work be monotonous? Surely it offers more variety than the work of the weaver at the loom who is content to see the pattern growing inch by inch; or the girl in the factory who all day long lifts one box and puts another in its place.

If the people of rural communities will only learn to see and make the most of their opportunities and advantages; if they can only be shown

that by careful planning and system in their work it will cease to be drudgery and become an art, something to take pride and pleasure in doing; if they can only learn that by planning they can set aside a portion of each day's time to devote to other things than the routine work; if this can only be ac-

complished the problems of the rural home as they are now will cease to exist and the inmates will learn, as Robert Louis Stevenson has said:

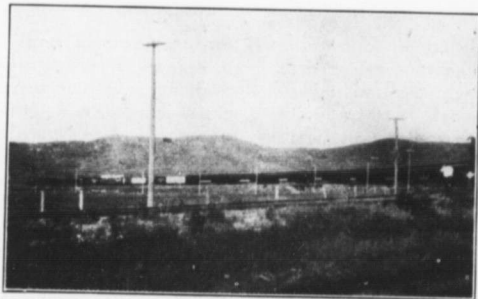
"To meet with cheerful heart what comes to me,
To turn life's discord into harmony."

Saskatchewan's Circulating College

By W. H. J. TISDALE, Assistant Professor of Animal Husbandry,
University of Saskatchewan.

TO most of us, the Better Farming Train is by no means an innovation. We have heard of it in different provinces and no doubt have visited it at some country point, criticising all the while this seeming "waste of time and money in an endeavor to teach the farmer more than he already knows about agriculture." We have heard of these "travelling colleges"

years* in the prairie provinces and in every instance have been doing much to stimulate better farming. If they were not doing this, the railway companies would not be so keen to operate nor would the agricultural authorities be so prone to spend a great portion of the summer at this kind of work. In spite of all this though, many of us will continue to criticize with that



Taking a curve on C. N. R., 13 coaches visible.

spreading the farming gospel amongst our American friends and some of us have wondered why the people stand for such nonsense over there. We know also that these trains have been operating for the past three or four

conservative side of our nature taking the upper hand, and when the train calls at our nearest town next summer, we take a day off with the rest of the neighbors and visiting this affair on wheels mayhap gather some ideas

and suggestions that had never occurred to us before. Taking these ideas home, we put them into practise and later on we decide that the day was not spent so badly after all. Thus it is that benefits may accrue, most indirectly.

For the past three years, the Saskatchewan Department of Agriculture co-operating with the College of Agriculture at Saskatoon and the various railways in the province, has been operating one of these trains for about six weeks during the months of June and July. The success, evidenced by attendance and interest shown has been more marked each year and one almost wonders if such a scheme will ever lose its popularity and usefulness amongst the people.

The work of the train has been most extensive, embracing as nearly as possible all of the more important phases of agriculture as far as the western farmer is concerned; animal husbandry, field husbandry, agricultural engineering, farm building, dairying, poultry and household science. In connection with these various phases of agricultural work, new features have been added each year until this summer the Canadian Northern Railway over whose lines the train was operating found it necessary to supply a train of fifteen coaches. Five second-class coaches fitted up for lecture purposes, two automobile cars and two flat cars on which to display the livestock, one machinery car equipped with engines, etc., one nursery car in which the younger children were taken care of, one refrigerator car carrying supplies besides two sleepers and a diner for the accommodation of staff and crew completed the "make-up" of this travelling University. One can easily imagine that neither time, money or labor were spared in making such

a train successful in its mission.

The main and branch lines of the C.N.R. running through the northern part of Saskatchewan provided the points of application, and commencing at Langham on June 12th the itinerary was completed at Alsask, a town in the famous Goose Lake country on July 14th. An endeavor was made to stop for one-half day at every second or third town, deliver lectures and then allow the people some time to examine the various exhibits and ask questions. In this way 56 places were visited during the five weeks and 22,973 persons came to glean information, thus making an average attendance of 410. This average was much exceeded at certain points of course, running even as high as 1,000 during the stop at Melfort, a town situated in the wonderfully fertile Carrot River Valley. The above total was composed of 8,245 men, 5,510 women and 9,218 children. Many of these people drove thirty and forty miles and some were even known to walk twenty-five and thirty miles to hear the lectures. It was encouraging to hear them say when the train was ready to move out that they would gladly come the same distance another season.

Anyone knowing the province of Saskatchewan will know that when Northern Saskatchewan is spoken of, the district referred to is vastly different to the prairie lands of Central and Southern Saskatchewan. The presence of abundant natural shelter in the form of bluffs that gradually broaden out into thickly wooded areas the farther north one travels, the presence of water in the form of small rivers and lakes and the endless stretches of natural pasturage in the form of native grasses and pea-vine not only make it well deserving of

the name "park country" but render it as well a veritable paradise for cattle and other stock. Farmers in these northern parts are rapidly becoming advocates of mixed farming and far-sighted men are realizing the profit that can be made by turning this natural growth and the coarser grains that are easily grown, into beef, mutton and pork. Such districts as Melfort, Prince Albert, Turtleford, Foam Lake and Saltcoats are already becoming famous for the quality and numbers of livestock each season and with the establishment of a closer market they should come to the fore more than ever.

Consequently, when the train was traversing such a country as that just described it is only natural to expect that one of the leading features for the men would be livestock. With that idea uppermost, good specimens of the leading breeds of horses, cattle, sheep and swine formed part of the equipment and at every stopping point these animals were led out on a flat car fenced for the purpose with 36-inch woven wire. Here, in full view of the audience, they were used for demonstration purposes by the different animal husbandry lecturers.

It is a matter of regret to all really interested in the advancement of the cattle industry that the "scrub sire" still finds a place and is still roaming at large in many farm districts, and every possible effort is being made to discourage the use of such. Therefore, as a means of illustrating the results produced on ordinary stock by the opposite type of sire,—the pure-bred, full-blooded kind,—three cattle were carried that made a most fitting example. One of these, the sire, was the pure-bred Aberdeen-Angus bull,—Glenmere Proud Lad, owned by the University of Saskatch-

ewan. A proud, masculine, well made fellow, weighing 2,050 pounds and covered with a wealth of thick, natural fleshing, he elicited praise from the most conservative and critical in every audience. Another, the dam, was a common, red, grade Shorthorn cow of no particular breeding, rather up-standing, somewhat angular and altogether lacking the make-up of a typical beef animal. Simply a useful farmer's cow. The third animal—the offspring, and incidentally the red cow's first calf, was a black and polled steer, 23 months old and weighing 1,350 pounds. This steer would pass as a pure-bred almost any place, not only because of his fine, thick, black coat and strong, polled, feeder's head but on account of his low-set build, his uniformity of parts, smooth shoulder, deep heart, wonderful loin and thick, deep hindquarter. He had been fed and cared for no differently than hundreds of other steers on farms all over the country; running with the cow for the first eight or nine months and after that time getting the roughage and coarse grains of the farm. Truly, a most convincing illustration of the results to be obtained from even the ONE good cross. What would happen if such a system were followed for two or three generations?

Sheep also occupied a conspicuous place in the livestock program and because of the season's boom in this direction, proved of greater interest than in former years. Several western range ewes with their twin lambs sired by pure-bred rams of Shropshire, South-down and Suffolk breeding illustrated how the proper system of breeding will intensify good wool and mutton qualities. Incidentally, many men had their eyes opened as to what can be made from one grade ewe, on initial outlay this season of \$9 or \$10.

As noted from the attendance figures given in the forepart of this article, one of the most pleasing features of this season's work was the presence of so many school children at every point. In many instances they numbered between three and four hundred and their enthusiasm and interest was just as overwhelming as their numbers. Many of the teachers in each district declared a half holiday as far as the school work was concerned and conducting the children to the train in a body, made it their business to see that the younger generation

most gratifying features of the whole trip was to see these children telling small groups of their elders all about the things they had seen and heard.

Much more literature in the form of bulletins and pamphlets found its way amongst these foreign peoples than elsewhere and particularly through the medium of the children. They simply devoured it climbing over each other to get at it and at Krydor, I was much amused at one little chap seated on the station platform with a huge bundle of bulletins under his arm while he read another. When



A Car of Interested "Livestock"

derived every possible benefit. Special lectures on birds and other subjects of interest were given in the "Boys and Girls" car after which the train in all its departments was thrown open for the childrens' inspection. At points such as Hafford, Krydor, Howell and Bruno, where the total attendance was ninety per cent. Doukhobor and Galician, the children were much in evidence and as a result of English taught them in the country schools they were the only ones who really understood anything of what was being said by the lecturers. It was very evident too that they absorbed a great deal of the information and one of the

asked if he were reading it, his reply was "Sure, I'm half way through, it's great." Somehow, this little incident seemed to convince me that if the Better Farming Train visited no other points than these few foreign settlements mentioned, it would have more than paid for all cost of equipment and operation. These children would undoubtedly operate through their parents and as a result, people, the most of whom are yet unable to attend our agricultural colleges, were having the college and its work carried directly to them:

Realizing also that the farm home is nowhere more important and no-

where presents so many problems as it does upon the prairie, the women's section has always been made one of the more important features in connection with Saskatchewan's "Train." The section consisted this year of two cars; one in which capable ladies lectured and demonstrated upon interesting phases of tedious household work and the other fitted up in the form of a nursery car where the younger children were left in charge of a matron. This latter proved a novel idea and one taken advantage of by mothers

interest to every man, woman and child, old and young in attendance. Models and plans of labor saving devices for the farm home, an electric lighting system for the farm buildings, gasoline engines, a model barn, a series of handy knots and illustrations of rope splicing were all carried in this car and the instructors in charge were kept more than busy answering a steady stream of questions relative to all these. It can be safely stated that no other car in the train's make-up was of more general interest.



An Interior View of the Domestic Science Car.

who were glad to be free for an hour or so in order that they might enjoy the train and all that it had to offer. Needless to say, the little ones soon became acquainted with the sand pile, the slide and numerous toys provided for their amusement in the nursery car, and after becoming thoroughly tired they were returned safe and happy to their mothers at the conclusion of the session.

Thus far, special features of interest to special groups have been described. It would hardly be right to pass by the mechanical car that was of direct

The features herein detailed are only a few of the many that assisted in making this train so successful and having inspected it thoroughly and spent some little time upon it, one would not hesitate a minute in saying that it should be productive of much good. The estimated \$300,000 equipment (coaches, etc., included) seemed amply justified in the results, direct and indirect, accruing from its operation and it is simply one instance of the habit Western Canada has of doing things on a big scale.

Should Barns Be Painted?

By J. SHALES '19.

TO the traveller and the casual observer of agricultural conditions in the Province of Ontario probably no feature in connection with farm equipment is so outstanding as the almost uniformly unpainted state of the barns, even among the most energetic and progressive farmers. It is estimated that only five per cent. of the barns in the Province are painted, so that, as an accepted farm practice barn painting is practically a negligible quantity.

The reason for this apparent lack of economy and foresight is not hard to find. In the past, the farmer perhaps more than any other individual has given his undivided attention to the bare problem of making a living, and the margin of money return was the criterion of desirability in any undertaking. A wide-spread and well founded impression that there is no money in barn painting has therefore been responsible, along with the cheapness of building material at the time most of the barns of today were built, for the general adoption of this negative attitude. An examination of the probable cost of barn painting will show that the position is not taken inadvisedly.

It is estimated that the total cost, including labour, of painting a barn is twenty-five cents per square yard for two coats, and thirty-five cents per square yard for three coats. This amount will vary, of course, with the quality of paint and the kind and finish of the lumber in the barn. A barn 80ft. x 60ft. with twenty foot

posts and one-quarter pitch roof has an area to be painted of 722 square yards, which would give a cost of \$252.70 for three coats. Repainting, which would have to be done at intervals of from five to eight years would cost considerably less than the initial application. This, with the added expense of seasoned and matched lumber in the construction of the building, would in the sixty to seventy-five years, which constitute the life-time of an ordinary barn, go far toward constructing a new building with up-to-date improvements.

On the other hand, it has been estimated—rather extravagantly, we think—by paint companies that thorough painting will make a building endure four times the length of its natural life. But, speaking conservatively, there seems no reason to doubt, that a barn should last at least thirty years longer, if adequately protected from weather in this way. With this fact in view, painting would seem desirable from an economic standpoint, since the high prices of building materials which prevail today make it necessary to prolong the life of any structure to the utmost. Dressed hemlock, one of the favourite materials for siding, costs from thirty to thirty-five dollars per thousand, as compared with about five dollars a half century ago, so that, with the whole level of prices correspondingly high, we can readily see the advisability of protecting the wood thus used.

In the selection of paint, when comparatively large quantities are re-

quired, it is advisable perhaps, to buy the materials and mix them at home. The paint is made by "cutting" white lead with turpentine and thinning with raw linseed oil, adding iron oxide, ochre or other pigment to give the desired colour. The addition of a dryer, such as shellac to the mixture will give it "body" and drying quality. The second coat will require a larger proportion of lead to oil than the first, which should be easily incorporated in the surface of the wood. Preparation in this manner ensures the use of pure materials and consequent lasting quality. Two coats of such a mixture properly worked in with brushes—not thrown at the barn with a spray pump—should remain in good condition for seven or eight years, but experience has shown that the most satisfactory results are obtained by renewing with one coat about every four years.

Apart from strictly economic considerations of the problem, there is a factor which should be decisively in

favour of barn painting, that of its decorative or aesthetic value. If paint of reasonable price and suitable shade, other than the red which is chiefly used, could be discovered, it would lend a pleasing variety to the effects, and at the same time not infringe on the long established right of our rural schools to the exclusive use of that particular inspiring colour. It is impossible to estimate directly the good effects of barn painting if put in practice generally. Besides very materially enhancing the selling value of a farm by creating an appearance of progress and prosperity, it cannot but be the source of untold satisfaction and even inspiration to the owner and his family to live in surroundings which are beautiful, and which reflect neatness and industry. The transformation of unlovely objects on the farm will also do a great deal to offset the attractions of the city in the mind of the country boy, and retain his efforts in the field of agriculture.

Fertilizers and Their Use

BY HENRY G. BELL, Chicago, U.S.A.

ED. NOTE.—This is a copy of the second address delivered by H. J. Bell to the members of the Experimental Union at the O.A.C. in January.

GENTLEMEN:—In the discussion of the question of soil fertility, I tried to point out this morning that the productive power of the soil depended upon the supply of moisture at the disposal of the plant, thoroughness with which the soil was drained, freedom of air circulation within the soil, presence of sufficient organic matter, and sweetness of the soil reaction. I also emphasized the rela-

tive influence of the suitability of the variety of crop purity of seed, care with which the crop had been planted and tilled, and the supply and balance of the essential plantfood constituents which are at its disposal. It is our purpose now to turn our attention to the question of plantfood and its use,—especially that type of plantfood known as fertilizers, or commercial fertilizers, or artificial fertilizers.

The multiplicity of names indicates to some extent the chaotic nature of current knowledge, concerning fertilizers and their use.

Fertilizers are carriers of available plantfood. They supply exactly the same constituents of plantfood,—nitrogen, the plant grower; phosphoric acid, the plant ripener; and potash, the kernel filler and stalk strengthener—as are carried by manure. They may vary in analysis since in the manufacture of fertilizers, the brand or type of fertilizer is produced of an analysis determined by the chemist and under his direction.

The production of fertilizers has been a process of evolution. Necessity is the mother of invention. With the rapid growth of population in European countries necessity required that more food should be produced per acre, if the living needs of the population were to be met. For instance, in 1800 Great Britain is reported to have produced an average of about 15 bushels per acre of wheat. In 1915 her average was over 32 bushels. In 1800 France produced about 11 bushels per acre, while in 1915 her average was nearly 20 bushels per acre.

Among the epoch-making inventions of the last few centuries, one of the greatest and farthest-reaching has been the discovery and development of the manufacture of available plantfood or fertilizer. Modern fertilizer manufacture had its inception in the work of three men, Von Liebig of Germany, and Lawes and Gilbert of England. These men, in studying how a failing supply of food could be replenished, discovered that better crops grew where bone had been buried than where no addition had been made to the soil. They also discovered that ground bone seemed to be more quickly used by the plant than the bones in their raw state. They

further discovered that if to ground bone a certain amount of acid were added, the bone would break down into such form that the resulting material would dissolve in water and could become immediately available as plantfood. This discovery marked the first manufacture of acid phosphate or super-phosphate.

Sir John Bennett Lawes, the founder of Rothamsted Station, in 1842, took out the first patent for the manufacture of acid phosphate, and founded the renowned Lawes Fertilizer Company of London, England. Lawes associated with himself a young chemist named Gilbert. These two manufacturers being of a scientific turn of mind, established a test farm, which has been operated for more than 60 years. So carefully and accurately were all the details of the tests of the various plantfoods in connection with various farm crops carried out, that on the death of these two experimenters in 1890 and 1891, the British government took over the management of the Rothamsted estate and maintained it on much the same basis as Dominion experiment stations are maintained.

This morning we demonstrated that all plantfoods in order to enter the plants, must be capable of dissolving in water. This was first enunciated by DeSaussure. We have already discussed the functions of the various plantfood constituents and the supply of the essential plantfood constituents in the soil.

The earliest form of soluble plantfood in fertilizers was dissolved bone, as already pointed out. Bone meal carries from 3 to 5 per cent. ammonia, as well as 18 to 25 per cent. phosphoric acid. There are two kinds of bone,—namely, raw bone meal and steamed bone meal. The former contains a higher per cent. of ammonia and a

lower per cent. of phosphoric acid than the latter. We have already pointed out that bone meal hastens the ripening of crops. However, there was not enough bone to supply the demand for this form of plantfood. The fertilizer industry consequently had to turn to the phosphate rock deposits of the southern part of this country. Similar deposits are found in some parts of Ontario. In the South phosphate rock occurs in two forms,—first, in layers somewhat the same as limestone in quarries, and second in the form of pebbles in the beds of extinct rivers. The fertilizer industry gathers the rock from either source washes and dries it and grinds it by means of powerful grinding machinery into a fine, flour-like powder. The standard is 100 per cent. to pass through an 80-mesh screen. The fertilizer industry now has to turn to a great sister industry, to obtain a special substance to break down the relatively insoluble phosphate rock. The industry obtains sulphuric acid and in the manufacture of acid phosphate adds just sufficient sulphuric acid to change the three-line, or insoluble form of phosphate rock to the one and two-line form, or the forms in which the material will dissolve. (These are the forms of the substance when it is called superphosphate or acid phosphate.) The finely ground rock and the acid are mixed into a sort of a mud-like consistency and are dumped into a den where chemical changes take place. The den is opened at the end of 12 to 20 hours and the material can be readily removed.

Sir John Bennett Lawes, the first fertilizer manufacturer found that the plant needed more than phosphoric acid, the plant ripener. The crops made more thrifty growth when nitrogen was added to phosphoric acid.

Tankage, or the material which comes from the slaughter-house, blood, and other waste portions of the animal body, contain a varying amount of nitrogen. It is prepared by cooking, dressing and pressing into such forms as can be used in connection with the plant-ripeners to supply that constituent of plantfood, nitrogen or ammonia, which has to do largely with the rapidity of the stalk growth. The fertilizer industry is one of the greatest agencies of conservation at work in the world today. It makes use of by-products which were formerly cast into lake and river and lost forever. It gathers waste products of the mine and the factory, and is actually tapping the air in order to obtain material which can be used in the production of crops.

There was not enough blood and tankage to supply the great demand for nitrogen, hence the industry had to turn to the soluble salt known as nitrate of soda which is obtained from South America. This salt contains about 15 per cent. pure nitrogen. Still further, the industry turned to the by-products of the coking industry. Underneath a large portion of this North American continent there lie great deposits of coal. This coal contains considerable ammonia which makes it impossible to use the coal in its raw state in the smelting of iron ore. As a consequence, the coal is coked; that is, it is baked in ovens until the ammonia is driven off and the remaining carbonaceous substance retains the power to produce heat, and burns readily. In the gas which is driven off, there is a considerable percentage of ammonia, or nitrogenous plant food. Later inventions have made it possible to gather this escaping gas in the form of sulphate of ammonia, a valuable nitrogenous plant food carrier.

Since the beginning of the terrible European conflict, we have been hearing a great deal about synthetic ammoniates. This means carriers of ammonia produced by a manufacturing process, which causes the building up of the ammonia carrier instead of the elaboration of it from other substances. Near at hand you have the great water falls of Niagara. Some years ago a company took advantage of this great power plant to locate a process for the manufacture of calcium-carbide, or a combination of calcium and carbon. In this manufacture it is found that by a further manufacturing process, it is possible to combine calcium and carbon and nitrogen. The air that you breathe contains about 80 per cent. of nitrogen. The new material is known as calcium-cyanamid or cyanamid. It is a greyish granular powder and contains considerable per cent. of ammonia or nitrogen. This manufacturing process makes the future look hopeful, for while the limestone holds out, and the carbon-dioxide found in the air, as well as nitrogen, and while powerful water-falls remain to be harnessed, a supply of nitrogen is assured.

In the southern states considerable quantities of the refuse of cotton seed is used as a carrier of nitrogen. You live-stock producers know full well that you sometimes purchase this material as a carrier of protein for your livestock rations.

Now, to the plant grower and plant ripener there must be added the stalk strengthener and the kernel filler. Previous to the outbreak of hostilities, the world's supply of potash came very largely from the Strassfurt mines, but since this supply has been cut off various continental sources have been studied. One of the most promising sources is the great bed of sea-weeds

on the Pacific and on the Atlantic. These sea-plants contain, beside other things, a considerable per cent. of potash. When the plants are dried and ground they become a source of this important constituent of plantfood. Besides kelp there is a rock found in the Rocky Mountains known as alunite. This rock is intensely hard and must be subjected to great heat and crushing, in order for it to liberate its potash in such form that the material can be dissolved and recrystallized.

In the dearth of potash, it behooves every one of you to take the greatest care of any substance which carries this important plantfood constituent. For instance, if you are burning wood, the ashes which are daily taken from your stove carry a considerable amount of valuable potash. Great care should be taken not to allow the ashes to be exposed to rain, for if such exposure is allowed the potash will quickly dissolve and be leached away. Similarly, leaves and straw should be carefully conserved and returned to the land, if the potash of the soil is to be conserved as much as possible. Of course, manure which contains from 10 to 12 pounds of potash per ton should be carefully stored as we have described and handled judiciously.

We have discussed the assembly of the three essential constituents of plantfood,—nitrogen, phosphoric acid and potash,—from various sources and from various parts of the world. The fertilizer industry is therefore one of the great assembling institutions of modern commerce. It gathers the product of the mine and the factory, the product of the sea, and the air, and by processes of manufacture, as just described, reduces them to forms that can be returned to the farm, the form of plantfood which supplies the plant with readily available stalk grow-

er, plant ripener, stalk strengthener and kernel filler.

In a modern fertilizer plant, much attention is given to labor-saving machinery and to machinery that is efficient in combining the materials described above. The manufacture of the different brands of fertilizers, or fertilizers of different analyses, is carried on under the supervision and direction of an expert chemist. He it is who knows from actual tests, the plantfood carried by the various plantfood carriers that he is making use of, and it is the chemist who gives the exact instruction as to how much of the various constituents to use in order to obtain an analysis of fertilizer on which he has determined. When the material has been thoroughly combined, it stands for some time before it is shipped to the farmer. When the shipping season arrives, all cured goods of various analyses are conveyed back to the grinders and sifters where they are thoroughly reground, re-sifted and then bagged for shipment. The curing and double-mixing processes insure drillable goods, which is so evenly mixed that each hill of corn gets the proper proportion of nitrogen, phosphoric acid and potash which is supplied in the plantfood under question.

If the plantfood, carefully prepared, is chosen of an analysis suited to the soil and to the crop, and is thoroughly and carefully applied it cannot fail to having a very marked effect upon the yield and the quality of the crop produced.

EXPERIMENT STATION FINDINGS.

Rothamsted Experiment Station, which is the oldest existing experiment station, has made long careful tests in studying soil-fertility and fertilizers. Some of their experiments having been running nearly 70 years. The illus-

tration shows that as an average of their wheat plots receiving complete fertilizer, they obtained an average yield of 31.2 bushels of wheat per acre, for 51 years, against an average of 13.1 bushels per acre on soil which was not fertilized.

Pennsylvania Station, as a result of 30 years' continuous culture, secured an average of 23.7 bushels of wheat per acre with fertilizers, against 13.6 bushels where no fertilizers was used.

Ohio Experiment Station, in an 18-year test, averaged 24.7 bushels of wheat per acre where they used suitable complete fertilizer against 10.7 bushels per acre where they did not use soluble plantfood.

As a result of an 8-year test, Indiana Experiment Station secured an average yield from fertilizers of 21.7 bushels per acre, against 13.2 unfertilized wheat.

A WISCONSIN POTATO YIELD.

A prominent Wisconsin potato grower decided to break up a virgin soil in the northern part of the state. He decided further to make a trial of fertilizers on this soil. At harvest time he obtained 390 bushels per acre where he did not use fertilizer against 470 bushels per acre where the plantfood of the soil was balanced by the addition of about 300 lbs. per acre of fertilizers.

Illustrations are numerous where an addition of 300 to 500 lbs. of suitable fertilizer per acre have increased wheat yields from less than 30 bushels per acre to over 41 and 42 bushels per acre.

The effects are not only found upon the crop to which the plantfood has been added. You have had a splendid instance of this in Dr. Zavitz's report of the hold-over effect of fertilizers where they were applied to potatoes and wheat and grass crops were grown in succeeding years, as reported this

morning. The addition of soluble plantfood to wheat when seeding down to timothy and clover or alfalfa almost insures a catch of these crops and gives the tiny plants additional vigor to meet the severe tests of the coming fall and winter.

We have sought to outline the preparation of plantfood, other than that which is produced on the farm. Plantfood which can give strength and vigor to growing crops, and plantfood which is used intelligently cannot fail to give to the farmer. Fertilizers, like farm machinery, must be correctly used in order obtain maximum profits. They should in all cases, be suited in analysis to make up for the deficiencies of the soil, and to meet the special needs of the crop. The fertilizer industry is an economical necessity to

the survival of American agriculture. It reaches out through all parts of the world to obtain carriers of plantfood, which it can combine with the waste products of our factories at home and with carriers of plantfood from our domestic resources.

The use of fertilizers is not a new and untried practice. It was established early in the 19th century, and has made European crop production almost double what is normally harvested on this continent. Its use and the great services it can render make it of especial interest to Ontario and to Canada at this time. Largest crops of best quality can be obtained if the home of the plant is properly cared for, and if the meals on which the plant is to live are both abundant and well balanced.

The Problem of the Water Supply in the Rural Home

BY R. R. GRAHAM, B.A., B.S.A., Dept. of Physics, O.A.C.

NOTE.—The illustrations shown in this article are taken from "Home Waterworks," by Dr. Lynde

FORTUNATELY, this country for the most part, is greatly blessed by an ample supply of good pure water in all seasons of the year. The thousands of wells and springs throughout our land giving daily drink to man and beast constitute for us surely a rich inheritance. The problem for us then is not one so much related to the source and supply as to the best methods of getting this water "on tap" in the rural homes. Nature has put the water in the soil at convenient depths and in many cases brought it even to the surface, surely man has ingenuity and thrift enough to get it delivered in the homes, or at such places where he needs it. In this article I

shall confine my remarks to the problem of water supply in the house, firstly, because it is there where it is needed most, and secondly, because there seems to be a strong disposition on the part of many farmers to reverse the correct order of procedure by installing a water supply system in the stables for the cattle first, and later in the house if they think they can afford it.

The question of the needs and value of a water system in the home should not, one would naturally think, require very much elaboration in these enlightened days, but the fact that only a very small percentage of the rural homes have running water is evidence enough that most of the people do

not appreciate the real value of this convenience, or else they are not looking at the matter from the right view point. Many people, no doubt, feel the need but think more of the cost and so the feeling soon vanishes, others are not so much concerned about the cost but do not know how to go about the task which is wholly, or nearly so, foreign to their business, and I suppose there are still many who think that they can get along without it the rest of their days just because they have done so in the past. The enthusiastic advocate of water "on tap" in the rural homes must for some time to come be prepared to meet considerable disappointment if his ideal is to see in his lifetime every home provided with running water. On the other hand, he should be encouraged by the fact that his work is of a very high order, and the field for operations a very wide one. The need and value, I fear, are not understood fully as yet by all, far from it; in fact it seems that the attitude towards this problem is not yet beyond that stage which would justify the efforts of a live comprehensive campaign for domestic improvements.

The farmers need a water supply system in their homes for these reasons; To increase their own efficiency, improve their health, to cause them to like their place of abode better and thus be more contented, happier, and optimistic, to make them feel and realize that they have the best kind of life on earth, and to aid them in their efforts to induce their children to stay on the farm. Other improvements, such as lighting system, sewage disposal, telephone, rural mail delivery, of course, all work to the same end, but some of them the farmer's wife can much better afford to be without than water "on tap." In these days, especially since the war began, we hear

much about efficiency, and this may be one of the outstanding lessons of the war. May it be so, for certainly we as a people need instruction on efficiency in all phases of our life and activity. A present-day expert on human efficiency defines the term efficiency as follows: "Efficiency is the power of doing one's most and best, in the shortest time and easiest way, to the satisfaction of all concerned." It would be well for us to ponder carefully his words and make an honest effort to realize the meaning of it in our own lives.

The farmer's wife has many duties to attend to and much hard work to perform every day in the year. Of necessity, she uses large quantities of water, and if she has not this water convenient in the house she must spend a great amount of energy and time, and often worse still, subject herself to extreme exposure and even danger in carrying all the water she needs from the well, spring or cistern, as the case may be. It would be alarming to know the amount of energy and time expressed in terms of horsepower that the average farmer's wife spends yearly for need of a water supply system in the home. In this connection I wish to call special attention to the following extract from a bulletin of the United States Bureau of Education, by President Joe Cook of the Mississippi Normal College.

"The getting of the water from the source of supply to the point of application requires more manual labour than any other item of house-keeping. The water for the kitchen has to be lifted from the well, carried to the kitchen, poured into a kettle, poured out of the kettle into the dishpan, and from the dishpan out of doors. This makes six times the water is handled, and a bucket of water con-

taining two gallons, with the containing vessel, will weigh 20 pounds. When this is handled six times, the total lifting is 120 pounds. The cooking of three meals a day on a meager allowance of water will necessitate 10 buckets, which will make, for cooking alone, 1,200 pounds of lifting per day. When to this is added the water necessary for bathing, scrubbing and the weekly wash, it will easily bring the lift per day up to a ton; and the lifting of a ton a day will take the elasticity out of a woman's step, the bloom out of her cheek and the enjoyment from her soul."

more business and greater efficiency it at once adds it, and usually on borrowed money too, why should not the farmer, the backbone of the country, do the same thing? It would pay him big dividends all the remainder of his days.

Let us now see how this desirable improvement in our rural homes may be brought about. At the outset, it ought to be borne in mind that there are many things to consider well before deciding on any definite method. Since the laying down of water pipes involves considerable cost and labour, one should be sure that the source of

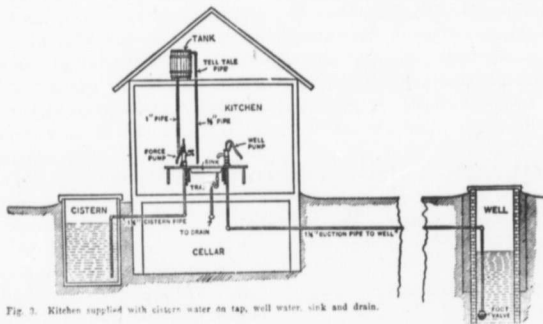


Fig. 3. Kitchen supplied with cistern water on tap, well water, sink and drain.

If the farmers realized the truth of such statements they would not be asking themselves the question "Can we afford to put an up-to-date water system in our homes?" but "Can we afford to do without it?" The writer is strongly of the opinion that the farmers must be made to realize that money spent in such improvements is one of the very best investments, monetary and otherwise, they could make, and, furthermore, that they would be justified in borrowing money, if necessary, to put in a good water system. If a railway company, for example, becomes aware of the fact that additional equipment would mean

water supply tapped is pure, unfailling and not likely at any future time to become contaminated, or for any other reason have to be abandoned. The well or spring should be made proof against surface contamination by raising a curb a little above the ground level, banking earth up to it, and laying on a solid cover that fits tightly.

The method of getting water "on tap" in the house may be roughly classified under gravity and air compression, the gravity method being either natural or artificial. An example of supply by natural gravity is that case, rather uncommon, where the well or spring is on much higher

ground than the house. This is the simplest, cheapest and most efficient system, but like all real good things, it's rare. The installation consists of laying below the frost line iron pipe from the source to the house, in the house lines of iron pipe branch off from the main to the various points of service as kitchen and laundry sinks, bath tub, wash basins, and so on. The turning of a tap releases the cool fresh water direct from the source. Artificial gravity, on the other hand, consists of pumping water by hand or power, say gasoline engine, from the source to a tank elevated in the yard, or located in the attic of the house. For the lack of something better this method has been used by a good many farmers, but not very many are satisfied to put in this system at the present day when better ones can be secured. Illustration No. 1 (Fig. 3) represents the gravity system with a tank in the attic for soft water pumped up by hand, and also the hard water delivered at the sink. With the improved sink pumps of the present day this method of getting water convenient in the house is not to be despised. Any farmer's wife, I am sure, would heartily prefer this method these wintry days just now to the drudgery and discomfort experienced in carrying pails of water every day from the well or spring. The men can usually be prevailed upon to do their share of pumping, but "good night" when water is to be carried. The complete bathroom equipment could be used with this system, the soft water being supplied it by gravity from the tank. But the tank is not absolutely necessary for to have the privileges of the bath, as the soft water may be pumped up from the kitchen direct to the bath room above, through a pipe having a goose-neck turning over the edge

of the bath-tub. Although, I believe, that in most cases it would be better for the farmers to put in the latest improved systems even at the extra expense entailed I would not be one to absolutely disparage the installation of the simpler, cheaper and less efficient ones to those who could not see their way clear to put in the best at the present time, for any system is decidedly better than none at all.

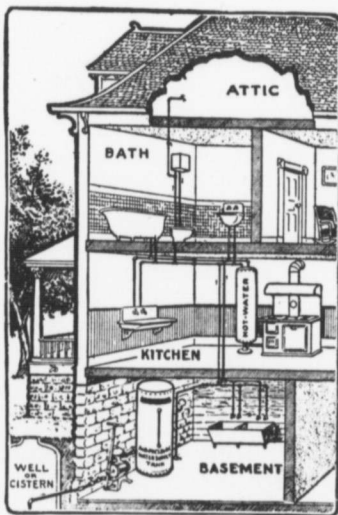


Fig. 50. Pneumatic tank water supply system.

In illustration No. 2 (Fig. 50) we get a look into a farm home equipped with the most modern system of water supply, namely, the air compression or pneumatic system. The principle of it is simple and natural; the water is pumped into the strong, air-tight tank seen in the basement, and as the water rises in the tank the imprisoned air in the top of the tank is compressed and thereby becomes the power to force the water from the tank to the

various taps throughout the house. The tank is usually one-half to two-thirds filled and under these conditions the air will exert a pressure from thirty to forty-five pounds per square inch, a sufficient pressure to lift water from sixty to ninety feet above the location of the tank. The pump is usually operated by a gas-line engine, or electric motor where electric power is accessible, not by hand as shown in the illustration, except in case of very small outfits. This system is becoming very popular for farm or suburban homes because of its many self-evident advantages over the gravity systems. The cost for a power-driven outfit suitable for the average-sized farm home is about two hundred dollars. The plumbing and necessary equipment for kitchen, laundry and bathroom will cost under present conditions at least another two hundred dollars.

A farm home provided with this equipment is as up-to-date and efficient as the average city home. This cost to many may seem too high, but in view of the advantages to be derived from this equipment I do not think it is. Figure it out.

The following named books and reports would be valuable additions to the farm library on the subject of improvements in the rural homes:

"Home Waterworks," by Carleton J. Lynde, published by Sturgis Walton Co., New York.

"Practical Talks on Farm Engineering," by R. P. Clarkson, published by the Musson Book Co., Ltd., Toronto.

"Domestic Water Supplies For The Farm," by M. L. Fuller, published by Jno. Wiley & Sons, New York.

"Transactions of the American Society of Agricultural Engineers," published by the Society, Ames, Iowa.

Gladioli

(THE PEOPLE'S ORCHID.)

BY W. HUNT, O.A.C., Guelph.

IF there is one flower that deserves the attention and commendation of all flower lovers it is the Gladioli, or Gladiolus. Its ease of culture, continuity of life, comparative immunity from attacks of insect pests or diseases, and its general aptitude to any average soil or climate conditions, to say nothing of the gorgeous orchid-like spikes of showy flowers it produces, easily entitles it to a foremost position among our summer flowers.

No genus of flowers has perhaps been given the almost universal attention in the matter of hybridizing to produce new varieties, as has the Gladiolus, not only in Europe, but also in Canada and the United States. Indeed it is

doubtful if Canada and our neighbors to the South of us have not,—especially during the last decade—produced a greater number of highly meritorious types and varieties of Gladiolus than have the hybridists of the flower loving countries of France, England, and other European countries where the Gladiolus was first introduced from its native habitat from Central Europe, Asia, and Africa. Much credit must, however, be given to such eminent hybridists as Van Houtte of Holland, Lemoine of France, Kelway of Somerset, England, and others for the noticeable improvement made in this flower, when compared with the original ninety or so of the original species at first

introduced. It is, however, during about the last twenty years that noted hybridists such as Luther Burbank, the noted plant specialist of California, H. H. Groff, of Simcoe, Ont., B. Hammond Tracey, of Wenham, Massachusetts, A. E. Kunderd of Goshen, Indiana, U. S., and other specialists have brought Canada and the United States into world wide prominence in connection with the many grand varieties by them. The writer of these lines can well remember the small and inferior types and varieties of these flowers about the year 1866 in England, of the *Brenchlyensis*, *Nanceianus*, and *Gandavensis* types. The very inferior flowers of those days sink into insignificance when compared with the magnificent introductions of the last few years, such as *America*, *Peace*, *Niagara*, *Kunderd Glory*, *Schwaben*, *Blue Jay*, *Dawn*, *Afterglow*, *Mrs. Frank Pendleton*, and the still more recent introductions of *Groff*, *Hammond Tracey*, and other growers such as *Chicago White*, *Loveliness*, *Mary Pickford*, *Lily White*, *Pride of Lancaster*, *Alton*, *White Glory*, and other quite new introductions. These are only a few of the many recent new varieties brought to notice many of which are at present too high priced for the average grower. The new ruffled or fluted and waved type of flower introduced by Kunderd, the first prominent one of the series being "Kunderd Glory," which caused quite as much sensation in the floral world as did the *Spencer* type of Sweet Peas among lovers of that popular flower in recent years. Possibly the rage for the large showy flowers now being introduced, will to a certain extent give way to the smaller, more unique, and perhaps the more useful type of these flowers from the commercial florists view point. The introduction of the



Kunderd Glory—Ruffled Type.

increasingly popular *Primulinus* type of *Gladioli* would indicate a slight reaction of popular opinion in this respect.

The foregoing notes on this popular flower gives only a very slight conception of the immense amount of skill and labor spent in the production of the *Gladioli* of to-day.

Fortunately for the flower lover, the flowering corms of good varieties of *Gladiolus* can be purchased for a very nominal sum. Really good named varieties can be purchased from 10 to 20c per flowering corm from almost all of our seedsmen and florists. Some of the more recently introduced new varieties raised from seed are very much higher priced. Many of them can, however, be purchased for about double the prices mentioned. Collections of older varieties may be purchased for about \$2.00 per hundred.

I would advise the beginner to purchase say a dozen or so really good varieties rather than the cheaper collections. By doing this for a year or two and selecting the best and most suitable kinds only, when they are in flower, and increasing the stock from the small cormels or bulbils from them, a large collection of good varieties can soon be obtained. The *Gladiolus* is par-

GLADIOLI CULTURE.

1. Location. An open sunny position suits them best.

2. Soil. They prefer a deep, well drained, fairly rich loamy soil, but will do well in almost any good garden soil. Do not dig in fresh strawy manure at planting time. If any manure is used, it should be well rotted, and should be dug in so as not to come in direct con-



Gladiola—O.A.C., Guelph.

ticularly suited for farm flower gardens, as it is not exacting as to soil, and requires less skill and care in handling than most other flowers. *Gladiolus* are not subject to attacks of insect pests or disease to any great extent, if given only ordinary care and attention.

The following short notes on the culture of these flowers and a small list of useful varieties may be of interest to flower lovers.

tact with the corms or bulbils. Manure is best dug in the fall previous to planting. The ground should be dug over again just before planting the corms.

3. Planting. The corms (bulbs) may be planted any time in May or early June. Flowering corms should not be less than one and a half inches in diameter. Plant the corms from three to four inches deep and about six to eight inches apart. They may be set either in rows about 2 ft. apart, or

in groups of seven or eight corms convenient for staking and cultivation. For field culture the rows should be $2\frac{1}{2}$ to 3 ft. apart. The small cormels (bulbils) should be planted about two inches deep, with the old corms or separately. These may be sown thickly the first year or two.

4. Cutting Blooms. Cut these with fairly long stems when two or three of the bottom flowers have opened, and put in water as soon as cut. Do not cut them any lower down than necessary, as low cutting weakens the corms. If about half an inch of the bottom of the stem is cut off every second day, the spikes will continue in good condition for a week or ten days after being cut. The top of old spikes of withered flowers not cut should be cut off when through flowering, before seed forms on them. Allowing seed to form will weaken the growth of the corms.

5. Storing for Winter. Gladioli corms should be dug up and stored over winter. Dig the corms before severe frosts, about the middle of October. Cut off the tops a few inches above the ground, dig the corms and put them in a shed or room away from frost for about two weeks to dry, then put them in a cool, fairly dry room or cellar, where they will not freeze, temperature about 40 degrees F. In damp cellars they may be tied in bunches, or put in baskets, and hung up to the joists. Do not store them near intense artificial heat, near radiators or furnaces. Before planting the large corms for the next season's bloom, remove the remains of the tops

and the old corms at the bottom. The small corms or cormels should also be removed and sown as before mentioned: The small plants from the cormels must be dug and stored during winter much in the same way as for the large flowering corms. Save cormels (small bulbils) from the best varieties. It will take three or four years to grow corms from the small cormels to flower well. Gladioli corms will often remain over winter in the ground, but do not give good flowering results the next season.

The following are a few of the many varieties that will make a good collection for an amateur's garden:

America—Dainty pink.

Augusta—White with blue anthers.

Baron Joseph Hulot—Deep violet blue.

Blue Jay—Light blue with dark blue markings.

Contrast—Rich red and white.

Cardinal—Crimson.

Chicago white—White, striped lavender.

Dawn—Coral pink.

Daybreak—Pale pink.

Halley—Salmon pink, early.

Kunderi Glory—Creamy pink, striped crimson (ruffled).

Mrs. Frank Pendleton—Light pink, blotched deep red.

Niagara—Yellow.

Peace—White blotched pale violet.

Princes—Rich dark scarlet.

War—Deep rich red, shaded darker.

La Luna—Creamy yellow, blotched purple chocolate.

Lily Lehman—White slightly tinted pink.

The Farmer's Garden

By H. NEFF '17.

EDITOR'S NOTE.—The following article is an extract from the Bulletin, "The Farmer's Garden," by A. H. MacLennan, B.S.A.

ALTHOUGH it should be an easy matter for any farmer to have a good garden, most of them give it but little attention. We may find a few vegetables growing near the house, but a continuous supply of fresh vegetables for the table is, apparently, not to be thought of. If they wish a larger supply they buy them from a vegetable grower. This is the easiest way, but they never obtain the quality which is only to be obtained when the vegetable is taken fresh from the garden by the housewife. After all, the making of a garden is a simple matter. All it requires is a little planning beforehand and the determination to give it as much care as possible.

Most farmers have every facility for making a good garden, and they, if anyone, should be satisfied with only the best on their table. I think that if they once had a garden from which the housewife each day obtained some fresh vegetables they would always plan to have a garden, and none but the best would please them. The meals would be so much easier to plan, and such variety would be added that our appetites would always be keen.

LOCATION AND SOILS: In choosing a location for the garden it is well to have it near the house. There are two reasons for this: First, there are many odd minutes, while one is waiting for a meal, or in the evening, when one would work in the garden if it were near the house; second, it is much easier for the housewife to obtain vegetables, and, therefore, she would be more likely to use them. If a slope to the south or south-east can be ob-

tained, this will be earlier and will allow an earlier start in the operations. However it must be remembered that the soil must be of the proper quality and well drained.

Most soils especially the heavy ones, should be manured and ploughed in the fall, but lighter soils may be left until spring especially if the manure is well rotted. Fall ploughing gives the frost a chance to pulverize the soil, destroys many of the insect pests which feed on garden produce, and permits of earlier cultivation. Cultivation should start as early as possible in the spring in order to get the soil in fine condition of tilth before the seed is sown.

MANURES.—To grow fine quality vegetables we must have high fertility, much higher than is common in most farm gardens. Well rotted manure should be used each fall at the rate of 25 to 50 tons per acre. All hen manure should be saved separately, to be used during the planting season on certain crops, as this is much too valuable a manure to be used like cow or horse manure. A certain amount of commercial fertilizers may be used to advantage at times. Potash, phosphoric acid, and nitrogen, are the chief constituents of ready mixed fertilizers but they may be applied separately in the following forms: Potash in form of wood ashes or muriate or sulphate of potash; phosphoric acid in the form of superphosphate, bone-meal, or basic slag, the latter being especially valuable for light soils lacking in lime; and nitrogen in the form of nitrate of soda or sulphate of ammonia. Potash at the rate of 200 to

250 pounds per acre and phosphoric acid at rate of 400 pounds to the acre may be mixed together and applied in the spring and worked well in, while the nitrogen is better applied during the growing season on account of its being quickly soluble. It should be applied at the rate of about 100 to 150 pounds per acre. The high prices of potash and nitrate of soda at present make them almost too expensive to be used and should be supplemented with wood-ashes and sulphate of ammonia when ever possible. Applications of lime may be of great benefit.

HOTBEDS.—As many of our best vegetables come originally from tropical countries where the season of growth is much longer than ours, we must use some means to give them this longer growing period. This can best be accomplished by using hotbeds and cold frames. Many may think that it is easier to buy from a greenhouse man but much of the pleasure in gardening is lost by doing so, and if a fair amount of care is used we can grow plants which will give as good, if not better results. If it is not convenient to construct a hot-bed, tomatoes and early cabbage plants, etc., may be grown in tin cans or berry-boxes in a south window the same as house plants.

The hot-bed should be placed on the south side of a building or a board fence where it is sheltered from cold winds and where the plants may enjoy all the sunshine possible. It will not be necessary here to go into the complete construction of a hot-bed as this is easily obtained elsewhere. Cold frames may be used in conjunction with the seeds planted in the house to good advantage.

All seed should be ordered early. By doing this one obtains the best quality and is sure of getting the varieties asked for. It is well to test

them to find out their vitality, so that we may know how thickly to sow. This is easily done by placing a certain number of seeds between two sheets of moist blotting paper and keeping them at about 70 degrees until they germinate. Then figure out the percentage.

FLATS.—These are boxes made 16 inches wide, 22 inches long, and 3 inches deep. They are used for starting the seed and to transplant the seedlings into later, to give them more room. They can be set directly in the hotbed and thus make hotbed work much easier, since you can pick them up and carry them inside to work with instead of having to leave the sash off the bed while doing the transplanting and thus cool it down greatly especially in cool rainy or damp weather.

Following are lists of fruits and vegetables which give the best varieties to plant:

Raspberries, red.—Marlboro, Herbert, Cuthbert.

Raspberries, black—Hilborn, Gregg.

Currants, black.—Climax, Naples, Black Victoria.

Currants, red—Cherry, Victoria, Fay Wilder.

Gooseberries, American. — Pearl, Downing, Red Jacket.

Gooseberries, English.—Industry, Whitesmith, Keepsake.

Strawberries—Bederwood (P), Williams (Imp.), Splendid (P), Parson's Beauty (P), Dunlop, Brandywine.

Blackberries—Snyder, Kittatinny, Aqawam.

SELECTED LIST OF VARIETIES OF VEGETABLES.

(Arranged in order of earliness.)

Asparagus—Argenteuil.

Beans—Golden Wax, Bountiful Green Pod.

Beets—Crosby's Egyptian, Detroit Red.

Brussels Sprouts—Paris Market.
 Carrot—Chantenay.
 Cauliflower—Snowball.
 Cabbage—Copenhagen Market, Danish Ballhead.
 Celery—Golden Self-Blanching, Winter Queen.
 Corn—Malatoff, Golden Bantam.
 Cucumbers—Improved Long Green.
 Citron—Colorado Preserving.
 Egg Plant—Black Beauty.
 Lettuce—Grand Rapids, Hanson.
 Muskmelon — Early Hackensack, Rocky Ford, Montreal.
 Melon, Water—Cole's Early, Harris' Early.
 Onions—Red Wethersfield, Yellow Globe Danvers.
 Parsnip—Hollow Crown.
 Pepper—Ruby.
 Peas—Grades, Thomas, Laxton, Excelsior, Stratagem.
 Potatoes — Irish Cobbler, Green Mountain.
 Pumpkin—Connecticut Field.
 Radish—Scarlet Turnip White Top.
 Squash—English Vegetable Marrow, Warded Hubbard.
 Spinach—Victoria, Viroflay.
 Tomatoes—Chalk's Jewel, Bonny Best, Stone.
 Turnips—Snowball Golden Ball.
 Swede Turnip—Westbury.
 Rhubarb—Victoria, Simacus.

There are many fungus diseases and insect pests which attack garden vegetables so I shall enumerate a few of the most common ones with which the farmer will come in contact, and some of the remedies or methods of control for these.

Bordeaux Mixture—Copper sulphate 4 lbs.; fresh lime 4 lbs.; water 40 gals. Dissolve copper sulphate in wooden or brass vessel with hot water and dilute to make 20 gals. Slake lime in a barrel in small amount of water, then dilute to 20 gals. Pour the two to-

gether and the solution is ready for use. Keep well agitated. Arsenate of lead or paris green may be used as a poison with this.

Poison Bran Mash.—One lb. Paris Green to 20 lbs. bran moistened with water. Add molasses or sugar to sweeten it and make into a crumbly mash. Apply around the plants in the evening and keep poultry and stock away.

Sticker.—Resin 2 lbs.; sal soda (crystals) 1 lb.; water 1 gallon. Boil together in iron kettle in open place about 1½ hrs until clear brown liquid results. This is enough for 40 gals. Bordeaux. Add 1 to 2 lbs. fresh lime if a poison is used with Bordeaux.

PESTS AND THEIR TREATMENT.

Asparagus—

Beetles—Spray with Bordeaux 40 gals., ars. of lead 2 lbs., and resin sticker, whenever beetles are troublesome.

Rust—Controlled with same spray.

Bean—

Anthracosis—Save seed only from healthy plants. Do not work among them while they are wet.

Cauliflower and Cabbage—

Cut Worm—Use poisoned bran mash.

Aphis or lice—Spray with "Black Leaf 40."

Maggot—Use tarred felt disc when planting out.

Cabbage Worm—Spray with ars. of lead and sticker when young and after heads form use pyrethrum powder 1 oz. to 2 gals. water.

Celery—

Blight—Keep plants well covered with Bordeaux mixture.

Cucumbers and Squash—

Beetles—Dust plants with road-dust or slaked lime whenever beetles are noticed.

Onion—

Maggot—Corrosive sublimate 4 ozs. to 50 gals. water. Pour liquid along sides of rows.

Radish—

Maggot—Use corrosive sublimate as above. Wash carefully before eating as it is very poisonous.

Potato—

Colorado Beetle and flea beetle—
Early and late Blight—Use bordeaux mixture when plants are about 4 to 6 inches high and keep covered throughout season. Add arsenate of lead.

whenever beetles appear, at rate of 2 lbs. to 40 gallons.

Tomato—

Blossom End Rot—Cultivate well and apply water during prolonged dry spells.

Leaf Blight—Spray with bordeaux mixture when disease first appears and keep plants covered with the spray throughout the season. This also assists in the control of the Blossom End Rot.

Tomato Worm—These may be kept under control by picking off the worms and destroying them while the first is being picked.

“Good Roads as a Public Benefactor”

BY D. MUNROE '18.

IT is true of the greater part of Ontario that township roads are today little if any better than they were twenty years ago. The last three or four years show considerable improvement along that line, but it does not compare to the vast expenditures, that have been made on steam and electric railways, express, postal, telephone, telegraph and cable services. The township roads are the public highways which lead to the homes of the people and are of the most universal benefit and the improvement of these is not keeping pace with modern methods of travel and communication.

The various benefits of good roads may be grouped under two main subdivisions, dealing respectively, with economic benefits and social benefits. There is at present no unique or final measure of either the economic or the social benefits accruing to a community by the establishment of good public roads. So intimately are the

public highways connected with every aspect of community life that almost any method devised to measure the benefits of good roads is incomplete.

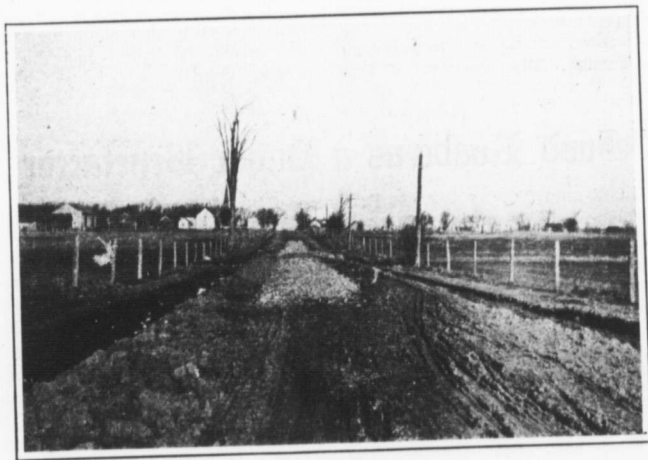
It is apparent, however, to anyone who has studied road matters for a period of years that the advantages of improved public roads have been repeatedly proved beyond all argument. There is no case on record where any community has ever regretted the improvement of its roads. It is doubtless true, however, that it is easy for good roads advocates to underestimate the difficulties of bringing about a reform in the condition of roads.

When the various ways in which good roads benefit a community are examined, a complex situation is found in which many actions and reactions take place. When good roads reduce the cost of hauling, adjacent land becomes more valuable; there is a corresponding tendency of population

to increase, and, in turn this tendency strengthens the demand for more good roads; social conditions improve; and the life of the community is influenced in many ways.

One of the principal economic advantages following the improvement of public roads is the reduced cost of hauling. Canada is an agricultural country, and in 1916 exported \$370,000,000 worth of agricultural products, which gives some idea of the immense

farming. Perhaps no cause limits such farming so much as poor roads. Of course, the prime requisite for successful diversified farming is a good market. This market may be either a nearby town or city, or a distant market which requires railroad transportation. In any case, however, the speed of transportation from farm to market is essential. Diversified farming usually means a change from staple crops such as hay and wheat,



A Common Type of Clay or Gravel Road.

amount of hauling over poor roads, and the loss resulting thereby.

Linked up with the decreased cost of hauling is the increase in land values, due to improved roads. In the 1914 report of the Ontario Highway Commission it is claimed that the increase in land value in 21 counties in Ontario has been \$12 to \$20 per acre, due to adoption of the county road system.

The farmers sooner or later come to realize the desirability of diversified

to the more perishable products of the fruit industry, vegetable gardening, dairying, etc., which must be marketed as quickly as possible.

It is a well established fact that market prices for even staple crops vary considerably throughout the year. Where bad roads prevail, farmers are forced to move their crops, not when the market price is favorable, but when the roads are favorable often causing a glutted market and break in the prices.

The social conditions of the communities are matters of serious consideration. If the term "social condition" is analyzed it will be found that all social activity is dependent upon the gathering of people for some common purpose. It is not difficult, therefore, to see the connection between desirable social conditions and the improvement of public roads. Social institutions such as schools and churches, are more or less subject to valuation in any community, but

tide of rural exodus, but it is clearly established that in seeking reasons for the movement the student of social conditions must be very patient in setting values upon many things which are not reducible to the common denominator of the dollar but which have repeatedly shown to be effective causes in depleting the rural population.

The question now arises, as to how are we going to improve the roads, and what encouragement is offered. The



Permanent Stone Road as Built under the County System.

they are by no means the complete measure of social conditions in that community. Bad roads are often a handicap to social intercourse, and now since the use of the rural telephone and mail delivery has become more common the people depend more and more on these modes of intercourse and consequently there is less intermingling.

The drift of the country population to the city is certainly to be deplored, and a way to explain this drift is often sought. It is not clearly established that good roads alone can turn the

province of Quebec has a system that is giving excellent satisfaction, namely,—the long term loan. The Government has set aside a certain sum of money to be used for road construction, and it is loaned to municipalities for a term of 41 years at interest of 2 per cent. per annum. The Government also loans the necessary road making machinery to the municipalities as well as supplying instructors or supervisors.

Ontario has a different policy in that they pay 40 per cent. of the cost of construction and 20 per cent. of the maintenance cost. This is taken up

by the county council and the construction of main or trunk roads is carried out under their supervision.

The various reasons why it is advisable to establish county road systems and its advantages over township systems are, briefly, as follows:

1. It sets aside a limited mileage of roads for immediate improvement. There must be a starting point; all the roads of the province cannot be built at once.

2. Expenditure can be concentrated on substantial construction. If roads are all under one body such as a township council, the mileage is too great to cover in a definite period, hence the expenditure is scattered over all roads in small amounts and little or nothing of a permanent nature is accomplished.

3. Roads can be built to suit the traffic over them. Roads forming a county system should be selected as to location so that they may serve all parts of the county.

4. Township councils are relieved from the cost of maintaining roads of heavy traffic and can consequently spread their expenditure more effectively over the greater mileage of roads carrying light traffic.

5. Better outfits of road machinery can be provided.

6. A better class of supervision and workmanship can be had, growing out of continuous employment and experience.

Township organization for road improvement is exceedingly important, and is giving good satisfaction. An experienced overseer is employed by the township council, who sees to the drainage of the roads, repairs to culverts, grading, dragging on clay roads, etc. He spends the money collected for road making according to his own judgement, aiming at equal distribution throughout the township. He hires men and teams for removing loose stone, gravelling where necessary, and on clay roads the use of the split-log drag.

In closing let me give an approximate average cost of various kinds of roads. Crushed stone roads which are the most practical at the present time cost anywhere from \$3,000 to \$5,000 per mile depending upon local conditions, the foundation of the road, drainage, and the length of haul of material. For a tarvia top we must add \$700 to \$900 per mile and from \$1,800 to \$2,300 per mile for a concrete top. The tarvia top road is becoming popular because of its flexibility, its freedom from dust and ease of repairing. It will no doubt prove the most economical road in the end. The concrete road is not only too expensive for the average community, but, it is slippery, is liable to crack with the frost, and is hard to repair if from any cause it becomes broken.



THE O.A.C. REVIEW

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EDITORIAL

It is a mistaken, yet common idea among some classes, that the farmer, upon whom the world depends for a living, should be looked upon with a sneer. The cause for this is that those holding this false impression have not stopped to realize the importance of the occupation of farming, together with the fact, which we cannot deny, that the average farmer does not possess that degree of education necessary for the most successful handling of the agricultural problems of today.

The war has done much good in bringing modern society to realize the importance of agriculture. It has shown our weaknesses and has made prominent the channels,—the church, the school, and the home, through which improvement of the rural community must take place.

Education is necessary. From the

report of the Commission of Conservation of a survey carried on in Dundas County we note that ninety-eight per cent. of the farmers visited had attended public school only, and one per cent. had attended high school. Ninety-two per cent. of the farmers' wives had attended public school only, and three per cent. had attended high schools. From such figures we may readily see that if the educational training of the average farmer is to be improved it must be done through our public schools. This can only be done by giving agriculture a more prominent place on the public school curriculum and by placing competent teachers in charge. The supply of competent teachers at present is very limited but until such change is made in the course of study the supply will never increase.

It is, we believe, a common opinion

among many farmers that improvements of farm buildings with the installation of modern conveniences would not be an economic gain. In two articles, "The Problem of the Water Supply in The Rural Home" and "Should the Barn be painted?" which appear in this issue the fallacy of such an idea has been clearly pointed out. Another example which may be quoted is that of a company in California which buys milk from the farmers. The company in question collects the milk and pays $2\frac{1}{2}$ cents more per cwt. of milk to farmers living on good roads than the farmers living on poor roads. Until such time comes when the farmers realize that by not taking advantage of modern methods and devices they are losing money, Agriculture in Canada will not occupy the high position to which it rightfully belongs.

Let Organization, Education, and Business Methods be our slogan in the future.

CAN YOU HELP?

The new War Savings Certificates which have been created by the Government to encourage thrift and economy and to give everyone an opportunity to assist in financing our war expenditure, are now on sale at every bank and money order post office in Canada. The \$25 certificate sells for \$21.50, the \$50 for \$43, and the \$100 for \$86.

As an investment these certificates offer many attractive features—chief of which are the absolute security and the excellent interest return. For every \$21.50 lent to the Government now, \$25 will be returned at the end of three years.

There are two other features which are especially interesting to small investors. First, the certificates may be surrendered at any time, if the buyer should need his money; and second, each certificate is registered at Ottawa in the buyer's name and, if lost or stolen, is therefore valueless to anyone else.

But while they are excellent from an investment standpoint, the certificates should appeal strongly to Canadians because they offer to those who must serve at home a splendid opportunity for a most important patriotic service. The person who honestly saves to the extent of his ability and places his savings at the disposal of the Government by purchasing these certificates, may feel that he is having a direct share in feeding, equipping, and munitioning our Canadian soldiers, who are so nobly doing their part.

ATTENTION!

We wish to ask all contributors to the columns of our magazine to have their material handed in to the Managing Editor or to the Editor of that department for which you are writing, at least three days previous to the date upon which all material must be sent to the printers. This is necessary in order that the material may be read, sorted and changed if necessary. Always sign your name to your article, otherwise it will not be published. If photos or drawings are to be used have them in a week ahead of time in order that cuts may be made. This is absolutely necessary in order that we may follow the schedule which was arranged at the beginning of the year.



NEWS ITEMS.

Alfred Howes '05 visited the college a short time ago and renewed acquaintances. He is farming at Clifford, Ont.

* * * *

F. A. Clowes '08 has been heard from recently. He is engaged in agricultural work at Lahainaluna School, Lahaina, Hawaii.

* * *

D. Dodding '18 has enlisted with the Army Medical Corps., B. C.

* * *

Eric Atkins '16 is now employed in the office of a large lumber firm at Lumsden Mills, Que.

* * *

Pte. C. E. Sanderson '18 visited the college recently. He enlisted in the spring of 1915 with the McGill reinforcement to the P.P.C.L.I. along with 35 other O.A.C. boys.

* * *

Of this number only McGuire and Pearson are left on active service with this unit. The remainder have been wounded or transferred to other units. Pte. Sanderson has been awarded the D.C.M. He manned a machine gun for 36 hours alone. After spending six months in a hospital in England with an injured spine, Sandy was invalided home to Canada. He may have to return to England but will more probably be given an appointment with

the Military Hospital Commissions Command which is to be established at Guelph.

* * *

L. C'pl. J. C. Agar '17 of Edmonton has been dangerously wounded on active service.

* * *

Lt. H. C. Mason '17 has been recruiting at the college for the Queen's University, Highland Battalion. J. F. McLean of year '20 has joined this unit. He will complete his course with the C.O.T.C. before leaving the college.

* * *

Leslie Lord '16 Lieut. R.F.A., was invalided home from the Somme in November. He spent Xmas and New Year's on sick leave and is now doing light duty on the East Coast.

* * *

N. Curtis '15 has been heard from recently. He has been on the Somme offensive since last March with the 13th Battery, Canadian Field Artillery, B.E.F.

* * *

It is with great regret that we must publish the news that the 56th O.A.C. Battery is no more. The O.A.C. Battery previous to its breaking up scored the highest percentage of effective shots in the Division. In spite of their good work, the battery has been split into two parts. Major Kent with Lt. Wilson and Lt. Benallick

are now with the 55th together with the right section which consists of '15, '16 and '17 men. The left section consisting of Sgt. Hill and Sgt. Bird's subsections with Lieutenants Culham, Burrows and Atkins is now a part of the 66th Battery.

The 55th and 66th batteries were four gun batteries and the 56th was split up to make each a 6 gun battery. The new organization will likely lengthen the period of training in England to some considerable extent.

* * *

Lieutenant G. A. Ames '18 who has been serving with the Army Service Corps in Collingwood, has been transferred to the artillery and is now attending the school of instruction at Kingston.

Jan. 13th, 1917.

Dear Professor LeDrew:

I believe I promised to write you a little account telling of my work and general doings. Many times I have started but always something has turned up to prevent me finishing my tale. Today I am going to make another start and will finish it for sure this time. It is going to be a general review of my experiences right from the start I made getting into the flying game.

"GETTING INTO THE WAR."

After many attempts to get definite information regarding the flying corps I finally received an application form and syllabus from the Department of the Naval Service at Ottawa. This was filled out and returned, and on June 6th I had to report to Vice Admiral Kingsmill in Toronto. After my acceptance into the Royal Naval Air Service I made my contract with the Curtiss Aeroplanes and Motors Ltd., and on July 17th commenced my training on flying machines. Getting in an

aeroplane for your first ride gives you a peculiar feeling, not one of fear but rather of expectancy coupled with uncertainty. Your instructions are to sit still and to hang on and by all means not to touch any controls. Then after you put your goggles on tightly, button up your clothes and generally get set you hear the old motor buzzing and the wind seems to blow right through you. This of course only happens in the tractor type of aeroplane, in the pusher type the engine and propeller are behind you. The engines are speeded up and tested on the ground before a flight. If the engine is going well, the blocks are removed from the front of the wheels and you get under way on the ground. While gaining speed the tail is lifted clear of the ground by pulling the control forward and the machine is kept in a straight path by pushing to the right or left on the rudder bar with your feet. The tail is held horizontally until flying speed is attained, then by a gradual pull back on your controls you leave the ground and are up in the air. As soon as you clear the ground all bumping disappears and you simply sail through the air. The very novelty of it all had me entirely. I wasn't the least bit dizzy and enjoyed the straight flying through the air very much indeed. All of a sudden one wing went down and the machine commenced to turn. With the machine or I believe a mile ahead of it something seemed to tell me that it was some sensation and I believed it. Turning from the horizontal to an angle approaching the vertical while turning is called "banking." This prevents the machine from slipping out in the air. If too steep a bank is indulged in while climbing, a side slip is apt to be the result because of loss of speed. This is not dangerous unless you are close

to the ground because sufficient height is not available to bring your machine horizontally again.

The density of air varies and when there is a pocket or a heavy wave of air you may either drop or be raised up quite perceptibly. My instructor took me up about 2,500 feet and did some stunts. For instance, he banked steeply, nose dived, climbed very steeply until the machine stopped dead with the nose up in the air, then of course we commenced to fall and after a drop of a few hundred feet the instructor would straighten her up, tap me on the back and, I suppose, laugh up his sleeve. He didn't really scare me but he surely made me wonder what would happen next. After all this preliminary fooling when we were up 2,700 feet the instructor started a steep descent in a spiral. The path of the machine in descent is just like your fingers make when following around a cork screw. When the machine first dropped it felt funny but I certainly was surprised to find that the air resistance almost entirely did away with the sensation of falling. Another peculiar thing is that while descending in a spiral it is practically impossible to raise your legs due to the centrifugal force. When within about 600 ft. of the ground the machine started a gradual descent in a straight line. When within 10 or 15 feet of the ground the machine was straightened out, kept level sideways and straight in line to the path of flight. As the machine lost flying speed she was brought closer to the ground and the wheels touched and stayed there. As the speed on the ground decreased the tail was lowered, and finally the tail and skid was on the ground. Thus ended my first flight. It is hard to write just actually how I did feel but all in all I enjoyed it.

As I became more and more accustomed to the sensation of being up in the air I liked the game better every time. Of course one feels proud to have his hands on the controls even if your pilot has his on too. But when he sits behind you, you do not know whether he has for sure or not hence you attend strictly to business. They start you making right hand squares, then left hand squares and then figure 8's. After you learn to do these correctly you are supposed to be getting fairly good at air work and you start making landings. Landings are hard to make and require a lot of practice. There is quite a lot in quickness and correlation of thought and action and no excuse for delay is allowed. Then the judgment of distance is very important and it is rather difficult to do. Moreover the machine must be landed with the wings horizontal and the machine straight with the path of flight. After all this is looked after there is a great knack in letting the wheels touch at just the right moment. I haven't had very much flying yet hence I dare not say too much until I learn a great deal more. After many disappointments and bad landings I gradually improved and at the same time learned to take a machine off the ground. When I learned all this to the satisfaction of my instructor I was allowed to take the machine up in the air alone. It is lonesome to be up there all alone and if you get lost you can't stop and ask for directions, but say it felt great to know that you were really flying the machine all yourself. On Oct. 12th, I flew my test and was finished with my initial training for the great war.

To see the country at its best you have to get up in the air. The whole countryside appears level, the colors

are toned down and you get a glimpse of the whole district in an instant. As you ascend; outlines become more and more indistinct, trees draw in close together, woods appear almost black and everything eventually blends together. Roads are discernable from a great height but bodies of water are the best guides. One of the most beautiful sights which I have ever seen was the day a fog rolled in while we were up in the air. Looking down on it, it looked like a huge woolly blanket studded with diamonds. From the point where it met the horizon right up into the heavens there was the most beautiful blue sky and old Sol made it all ever so cheery and bright. As we dived and came slowly through it mother earth emerged slowly and finally appeared in her mid-summer garb.

On the completion of my training in Toronto I notified the Department of the Naval Service at Ottawa and awaited instructions regarding my transportation to England. In this time I was making preparation for my trip overseas and generally making ready for the final leave. When I saw the array of socks and knitted scarfs I thought to myself that I had enough to last two fellows the rest of their natural lives. But when you are pounding gravel in heavy boots the sock question rapidly solves itself.

On Nov. 3rd, I had a farewell dance at Macdonald Hall and I believe the memories of it and the previous good times I had there will last until I have a chance to live those old days over again. Before I left home on Nov. 9th, I took pictures of the college buildings and grounds and it certainly has been great to have them over here. Many of the people in this country are deeply interested in Canada and they seem to enjoy seeing Canadian

places of interest and especially winter scenes. It makes a fellow proud to show them because you certainly do not need to be ashamed of them. They are the best in the world, that is certain. All Canada needs to do is to watch herself grow with careful foresight and administration and some day she will be the greatest country of all. She already possesses the potential energy and surely the guiding hand will be forthcoming.

Our boat left Montreal on Nov. 11th, and in three and a half days we were out in the Atlantic bobbing around like a cork. The St. Lawrence was rather bleak and dreary and the trip down it was decidedly dull. The boat was not very good and we had a very quiet crowd. The captain and officers were very nice indeed and there also were some nice people on board but not enough of them. We were twelve days getting across but I wasn't sick so that helped a great deal. The weather for the most part was exceptionally fine and only one real storm came our way. Somehow or other a boat surely can rock and bob around in the most annoying fashion and there doesn't seem to be the least chance of making it be still for a moment. After a time it gets monotonous but when you become a real sailor they say you like it. I am looking forward to that time. We came in on the south-west coast of Ireland and passed the point off where the Lusitania was sunk. Patrol boats were very thick and they made you feel safe. During the night we passed up the Irish coast then across the channel and up the Avon river to Avonmouth. There we docked in the early morning and got our landing cards, had our baggage examined and our passports. Then we went on shore and took the train to Bristol.

The English trains are certainly small in size but they can travel and the road beds are remarkably smooth. At Bristol we caught the train for London, 120 miles distant, and in just two hours arrived at Paddington station. Now Bristol to London is a very beautiful strip of country and I enjoyed real English countryside. The homes are cozy and comfortable looking and the whole place is decidedly well kept. In fact it looked like a huge garden to me. My first impressions of London were not very flattering. In the first place it was damp, chilly and drear and in the second place I was a perfect stranger in a strange land and just didn't know what to think. London is decidedly a great city and really and truly London. No place that I have seen reminds me in the least of London so I should say that it is unique in being all its own. Many things can be seen that are very interesting indeed and a great many more cannot be seen owing to the war and the rows which the suffragettes stirred up about a year ago. To really see London, about six months would be necessary and then you could go some more. London is very gay with theatres, popular eating houses of all sorts and London girls of all descriptions, sizes and colors. But London is a dreary place unless you know people right in their own homes. I was very fortunate in meeting some nice people and they have been remarkably good to me. If it hadn't been for them my eleven days leave in London would have been very quiet and dull. As it was I had a perfectly grand time and like the place very much indeed, except the climate.

On Dec. 3rd I arrived out here at Crystal Palace and started as a pro-flight officer in the Royal Navy. On December 4th I commenced squad

drill, physical training and lectures. At the end of three weeks I had my examination in squad drill and passed out. Then I started taking lectures all day long. These lectures included engineering, air craft construction, theory of flight, meteorology, map reading, musketry and signalling. All of this is interesting work and I have enjoyed it.

Now I am billed for France and on the 20th of this month expect to be on my way there. I have one more inoculation to get, then I am ready from the preparation standpoint. My stay at Crystal Palace has been very enjoyable and I hope that the rest of the places will be somewhere nearly as good although I hardly think they will be.

In France we will get real flying and I am looking forward to it. May be I will be disappointed but I hope not. There is a lot of work to be done over there so I guess it is up to me to do my share and I hope that I will turn out to be a good flyer. It is a great game and it gives a fellow a chance to do things. That is something that is worth while.

This has been a decidedly rambling little review, but I hope it will tell you just how I have felt since I became connected with the Royal Naval Air Service.

Pro. Flight Officer J. P. Hales, R. N.,
Care Sheed Thomson Co., Ltd.,
Hibernia Chambers,
London Bridge,
London, Eng.

Dr. G. C. Creelman,
Guelph, Ont.

Dear Dr. Creelman:

While on church parade this morning endeavouring to concentrate my mind on the sermon, my thoughts would continually wander back to the dear

old O.A.C. in spite of my religious temperament. For about ten minutes I wrestled in my mind with sermon and the O.A.C. and its associates, but knowing it must be one or the other, I decided to dream of the latter. Then, here comes the touching part of my mental sermon—as I thought of the past and all its connections some unknown spirit from within reminded me, that there was no time like the present to write to those that one highly esteems. So, to be brief, this explains my sudden impulse to actually write a few lines, while granted a few minutes leisure between church and stable parades.

First, I must tell you of the great achievement of the 56th O.A.C. battery, which, perhaps you have already heard.

The past ten days the gunners of our "Division" have been down to "Salisbury Plains" completing training for real duty overseas by way of "Firing Practice." We fired several hundred grounds of live 18-lb. ammunition out of our "Whizz Bangs!" from positions taken up on the field, just the same as in actual warfare. It was most interesting and instructive work, as well as creditable to the 56th boys. For, when completing the practise we learnt with great satisfaction that we had accomplished the best shooting, scoring the most effective hits of any "Canadian Artillery Batteries." This, indeed was most encouraging news to the officers and men, for we really felt that our continual drudgery of "section gun drill" had not been altogether in vain. Our score was 97 effectives, which is, I am given to understand 21 more effective hits than the previous "Canadian Record" for the number of rounds fired. So, you can imagine, the high spirit of us all, but I am pleased to report that so far, there has been

no cases of "swelled heads" among the boys.

Since writing you last, I have had the great pleasure of cruising among the English farmers during my last four day leave. I visited Surrey, Herts, Norfolk, Suffolk and Essex and had every opportunity of getting acquainted with farming under war conditions. The country is feeling the scarcity of manhood most severely at the present moment, which is readily observed by the change in nature of farming. "Essex" the largest dairying district in England where the city of London looks for her greatest amount of milk, has cut down her supply to the Metropolis by 50 per cent. during the last four months. One district, Orsett, with eight mile radius, alone, has sold nine hundred head of milking stock, since last September. This shows that the shortage of labour has hit the dairy industry hard. These farmers are seeding down the cultivated fields to pasture and hay—alfalfa—for raising fat stock which can be done with less labour. A friend of mine in this particular district who used to milk one hundred and fifty cows, has reduced his herd down to seventy-five, which he handles entirely, along with 300 acres, with one man, a boy and himself, along with a good reliable milking machine. He said the Government had called up his only man for military duties for the end of January,—this being the case, he is selling his entire stock of dairy cattle, replacing with fattening stock and raising hay.

As far as I could gather from talking to him, he was quite contented to give up dairying for the duration of the war, as, with the present price of stock and hay, he could make better and easier returns. But the people are the sufferers, which is as we know, practically unavoidable for awhile, at least. What

impressed me the most during my trip was the universal use of the "milking machine." I used to be very dubious regarding the actual usefulness and satisfaction of this machine, but I have since entirely changed my ideas. There are several different types of milking machines used by the English farmer, but the one that seems to give the most satisfaction and the greatest favorite, is the Australian make of machine, "The Bertram." It is simple in construction, easy to keep clean, the cows like it and milk better than by the old style of hand, and a boy can run it. I do not remember seeing this make of machine in Canada, but if not, I feel quite confident it would meet with great approval wherever tried out,—even our dairy department. Then, another startling point of interest to me, and which is a great advancement in this old part of the world, since I was a boy on the farm in Scotland—is the up-to-date farm machinery. Yes, only twelve years back and even five years ago, the farmers used to depend on the old reaper, and women and children to tie sheaves, to gather the harvest. The back-breaking method of pitching hay on the stacks and the slow single plow, are very nearly all replaced in most districts, where soil and conditions are favourable, by up-to-date hay sweeps and stackers, loaders, binders, drillers, seeders and tractors. Essex, especially was very outstanding with the tractor gang plows. I understand the war has been the means of this change, to some extent, in working the slow and do-as-my-forefathers-did-farming folk of England. Well, I feel I have burdened you with too much scribble to diagnose in one sitting, especially on farming, but my heart is more with the land, than with "military affairs." So here's my best wishes for 1917 and best regards to all. A class '17 boy.

Yours very sincerely,

Andy Fulton.

Address—

No. 324950, 56th Battery,
Care Army P. O.,
London, Eng.

Dear —:

I am writing this at the mouth of a deep German dug-out. The stench is awful. Just in front of me in a narrow temporary trench, an Australian is sitting very comfortably, holding on a cushion of soft mud. He is in full equipment from his gas helmet slung from the right shoulder, to the bombs at his belt, nothing is out of place and his puttees are the most neatly rolled I have seen for days. Between his hands on his knees is a hunk of bread. The sun is shining and the wind is whispering over the mud. The Australian is dead. Where his head once was is a mass of gorged blue-bottles. His lower jaw is hanging on the lapels of his collar. To my left is a very fat Westphalian. He has no legs but he looks happy except for his eyes. They are quite flat and heave a little with maggots. To my right are three German officers. I would not know they were human except for shreds of uniform and a terrible odour. Not very far away is a quite fresh and peaceful looking mule. He, she or it is partly in, partly out of a crater hole. The ammunition boxes are still in place upon the pack saddle. Two legs protrude below its neck and a very white hand with big freckles on it is gripped into the surcingle. I am in Golgotha. To get here we have travelled for five days through peaceful France. We have come through marigold fields, clover and happy villages, to the suppurating ulcer of Europe. We have dug ourselves in, and many a poor remnant of humanity out of the

sticky clay that overlies the greasy chalk. The trees are scarred stumps. The villages are mere masses of bricks, mud and the debris of an army fled. The guns roar unceasingly day and night. A little to my front lies the Creme de Menthe, lifeless, grim, grotesque, like some dead antideluvian creature. A little to her left, in a shell hole, to be measured by yards, not feet, lies another tank. There is literally not one foot of ground that is not either a portion of a hollow or a ridge. We shall not be in this place very long. No one ever is as nothing mortal, man or horse can bear the strain for long. The shells are flying overhead, singing, "Weeooo! Weeooo!" and sometimes droning like the deep bass notes of an organ if they are badly centred. I think I shall write a dictionary of bullet sounds soon. I have discovered that a bullet goes "weep" with a snap to it when a sniper is very close and "Wheooo" long-drawn out when fired at long range. They also go very shortly "wz" which means too beastly close altogether. I can also distinguish from the whirr, scream, whistle, roar or burst what kind of gun every shell comes from. Yesterday, I learnt a new one when they turned a 5.11 inch naval gun on to the battery and came near demolishing some of it. A miss

fortunately was quite as good and even more interesting than a mile.

I do not know what the Guelph Battery will do for dinner to-morrow, as I hear the cook got his head muddled up with a Hun 4.13 and had it painlessly extracted at one sitting. It seems a shame to joke but really we only get technically interested when we see another battery shelled. It is different when one of one's own men gets hurt though, then it comes home.

I have to finish registering a new target so must stop now.

Yours sincerely

A. Cory '15 (Major.)

The following letter was received by W. H. J. Tisdale '13 concerning the death of a class mate Lt. L. J. Hextall who has made the supreme sacrifice.

Dear Sir:

Your parcel addressed to Lt. L. J. Hextall, has been received and contents distributed to his section. I regret to inform you that Lt. Hextall died of wounds on 21-11-16. He received his wounds on the 18-11-16 in an attack. I was personally with him when he died and also buried him.

Yours sincerely,

T. B. T. Hewett, Capt.

Athletics

HOCKEY.

The first round of hockey was finished on Monday, February 5th, and proved to be the most exciting series played at the college in some years. The Sophomores claim the title of champions of the round, good luck, and hard work, being the main factors in holding the place for them.

On January 26th the "Sophs" and

Freshmen clashed, resulting in a victory for the "Sophs" by a score of 5-2. Smallfield in goal for the Freshmen played a star game. At periods it was a perfect bombardment but he seemed to always have some part of his body in front of the puck.

In the next game the Freshmen and Seniors fought it out to the tune of 3-1 in favor of the Seniors. McKenzie for

the Seniors was the "ever" shining light, scoring all the goals on individual rushes. McKillican also put up a good game at defence, with the aid of "Rusty Zavitz," who is a star—"sometimes." Marritt and Pawley did some effective work for the Freshmen, Pawley getting their lone tally.

The third game of the series was far the best hockey played here for some time. The people seemed to know this was to be the battle royal. As a result every corner of the gallery was filled, some even clinging to the steel framework over the ice. Another thing was also noticeable, that was the undesirable feeling which exists between the Juniors and Sophomore years. In the first period the Third year developed a combination which carried the puck within the danger zone many times but the close checking of the "Sophs" prevented any scoring. During the second period Higgins made a nice individual rush and placed the rubber in the nets. This seemed to get on the Third year's nerves and they came back with a rush, MacDonald scoring. Michael's weight came in handy sometimes but Iveson was awake to the fact and gave him a rest on the boards. Also, Allan's stick seemed to linger around the ankles of his opponents too much; it is too bad such a fast stick handler should develop such a fault. In the last period the third year really out-played their opponents but luck seemed to be with the "Sophs." The game remained a tie up to the last half minute's play when Shales with a "scoop" shot dropped the puck in one corner of the net, making the score 2-1 in favor of Second Year.

The last game of the series resulted in a victory for the Juniors, overcoming the Seniors with a score of 5-2. This game lacked the snap of the for-

mer ones and there was too much playing the puck. Newton the Junior's fast wing did some good work while McKillican was the only Senior who was effective.

The series which is to follow this round, should prove to be even more exciting; all the teams have improved and have more confidence in their men.

BASKETBALL.

St. Jeromes vs. O.A.C.

The college basketball team had their first chance of the season to show their ability when St. Jeromes played them in the college gym. on Saturday, the 27th of January.

The O.A.C. team was much heavier but lacked the combination that the visiting team displayed. Two twenty minute periods were played and were exceptional for the clean playing, not one man getting any time on the side line. For the visiting team Cutler starred, being very fast on the floor. "Art" White and Michael put up a good game for O.A.C. "Art" is noted for his "coolness when finding the basket."

In the first period St. Jeromes rushed the ball into O.A.C. territory and scored twice, then "Art" White made a nice basket on a long shot. After this St. Jeromes scored two more; this seemed to liven the college team up and "Art" got two in succession, one on a long pass from Michael, the other after a combination with O'dell. This ended the scoring for the college during the period but St. Jeromes seemed to be going a favorite pace. Cutler got a difficult net after which Hawkins scored on a foul. The period ending St. Jeromes 11, O.A.C. 6.

In the second half O.A.C. bucked up and exhibited some excellent passing, also Michael was a wonder at guard. "Art" White was the means of getting

combination going and as a result got nine points. Cutler for the visitors was fast and tallied two baskets but this seemed to be their limit.

Zeigler tallied two points after taking Wallace's long pass, then "Pinky" took his turn and made the spectators gasp by balancing the ball on the edge of the basket some seconds, before rolling in, making the final score 17-15 in favor of O.A.C.

* * *

The return game was played on Wednesday, February 7th, in Kitchener which resulted in a better win for the O.A.C. boys. The large floor space together with peculiar build and tilt on the baskets seemed to be favorable to the O.A.C. team. The result was a run-away with a score of 24-11.

The line-ups were as follows:

St. Jeromes—Hawkins, Cutler, Buckhit, Hopkins, McHugh.

O.A.C.—White, Musgrave, Wallace, Michael, O'dell, Zeigler, Evans.

* * *

GALT AT O.A.C.

Improvement was plainly seen in the playing of the O.A.C. boys against Galt on Saturday, Feb. 10th, combination and passing being much snappier than in the former game with St. Jeromes, this is mainly due to the excellent coaching of "Ken" Forman and "Art" White.

The Galt boys were especially weak on the guard and shooting, but their good sportsmanship made up for these faults. "Art" White starred for the college, also "Bill" Michael put up a stiff game. Carley of Galt showed he was an old timer at the game by his fast work, getting nearly all the points for the visitors.

Two twenty minute periods were played, at the end of which time the score stood 26-12 in favor of O.A.C.

"Ken" Forman and Jack Baker

handled the game to the satisfaction of all. Line-ups were as follows:

Galt—Blaine, Kerr, Carley, Bond, Hannam.

O.A.C.—O'dell, Zeigler, White, Michael, Evans.

FRESHMEN'S INDOOR MEET.

The Annual Freshmen's Indoor Meet was held Saturday, February the 3rd, in the college gym and, as usual, the different events were hotly contested.

Bouis who has the record for height at the college, being six feet five inches, did some good work and came very close to adding some more records to his name in the "hitch and kick" and "long plunge."

Another athlete of some ability was found through this meet in Pawley, who lowered the record of 2 1-5 seconds for the 15 yd. dash to 2 seconds. He was also one of the winners in points, being one of the three to get 21 points. Two others who did some fine work were Hamilton and Leavens. Hamilton should show the fellows some real shot-putting in the Inter-year Meet.

How closely the events were contested can be plainly seen by having three men tied for the grand championship, Bouis, Hamilton and Pawley.

If the Freshmen turn out for the Inter-Year Meet they should make the Senior years work for their points.

Events and winners at Freshmen Indoor Meet:

Rope Vault, 11ft., 2in.—Hamilton, Brown, Frey.

Pole Vault, 7ft., 11in.—Pawley, Misener, Arnold.

Running High, 5ft., 1 $\frac{3}{4}$ in.—Bouis, Patchett, Nixon.

Standing High, 4ft., 4in.—Pawley, Nixon Misener.

Standing Broad, 9ft., 6in.—Misener, Pawley, Hamilton.

Fence Vault, 6ft., 1in.—Frey, Hamilton, Patchet.

Hitch and Kick, 8ft., 6 in.—Bouis, Patchet, Patterson.

Chinning Bar, 20.—Frey, Hamilton, Leavens.

Rope Climb, 10 2-5 sec.—Johnston, Hamilton, Arnold.

Shot Put, 37ft.—Hamilton, Bouis, Nixon.

15 yd. Dash, 2 sec.—Pawley, Nixon Hamilton.

60 yd. Potato Race, 15 1-5 sec.—Leavens, Pawley, Arnold.

AQUATICS.

50 yd. Swim, 30 2-5 sec.—Leavens, Bouis, Harold.

Long Plunge, 43ft., 11in.—Bouis, Leavens, Brown.

College Life

UNION LITERARY MEETING.

The second Union Literary meeting of the Winter Term was held on Saturday evening, February the third.

The debate between the Freshman and Sophomore years was the chief item of the program. The subject was well handled by all speakers, although it was an extensive and rather confusing one, namely, "Resolved, that competition is more beneficial to humanity than co-operation." Messrs. J. W. Thompson and H. C. Harris upheld the affirmative while Messrs. R. Atkins and A. Musgrave argued for the negative.

The judges were Messrs. G. H. Unwin, B.S.A., H. S. Fry, B.S.A., and W. Stanley, B.S.A. The former, acting as critic, spoke highly of the debate and offered a few helpful suggestions to each speaker. The decision was unanimous in favour of the negative.

The opening musical numbers were piano solos by Miss F. Burton, which were much appreciated. We were also favoured by a few selections from the college quartette which were very much appreciated.

Following the debate Misses A. Jackson and E. Aitken held the audience spellbound by a beautiful piano duet and although heartily encored there was no response from the obscure

rear seat. The violin solos by Mrs. L. Iveson were also exceptional numbers and we hope we may be favored with her company at our meetings again in the near future. At the conclusion of Mrs. Iveson's encore all joined in singing the National Anthem and the meeting dispersed. A.B.J.

HONK! HONK! HONK!

Who has not watched the emblem of Spring coming northward, the "V" with the old leader at the head and his progeny in two waving lines—the wild geese; always a welcome sight. The interest people take in Canada's greatest game bird was shown by the large number that took the opportunity of hearing Jack Miner give an illustrated lecture on his work with Canada's fast disappearing game birds. To use Dr. Creelman's words: "Many more were present than ever were at church, even if both were free."

Jack could well be called the "Billy Sunday" for the protection of wild fowl. While not an orator, he kept his audience in that tense attitude of expectancy for over two hours, and they were fully rewarded. He had a double message to give them: first, his discovery of a God as revealed through nature; secondly, his discovery that more pleasure was to be had by pro-

tecting our wild fowl than by destroying them, and that even the beasts of the field and the wild fowl of the air had a message for him. Jack, to use his own words "was born bare-footed" somewhere in Missouri and came to Canada as a boy. During his younger days he was a market hunter; the wild fowl knew him as an enemy and the idea occurred to him that they would also know him if he was a friend to them.

The discussion on the rearing and protection of the Canada Wild Goose, the Mallard Duck and Quail was very interesting and educating. The fellow who believed himself a sportsman became converted and went home with the determination to throw away his gun and adopt the newer method of hunting—with a camera.

The ladies were not neglected either. The cruelty of the feather hunter was shown, birds being shot for a few feathers to be used for millinery purposes. This practice is rendered doubly cruel by the fact that the plumage is best during the nesting season and when the parent birds are destroyed the little ones die a lingering death due to cold and starvation. A substitute was offered for this practice, that of rearing pheasants for their plumage a business which should be a paying proposition.

The folly of man was pointed out in the introduction of the English sparrow into Canada. This bird is not wholly a grain feeder, but takes the nests of swallows and other small birds that live on insects, driving them away and killing any small birds that may be in the nest. The swallow once so common around our buildings is now only a casual visitor, due to the ravages of the sparrow. Of the 70 or 80 species in Canada, the English spar-

row is the only one that is not beneficial.

We learned that the U.S. is much in advance of Canada in her policy for the protection of its wild fowl. Mr. Miner received a grant of one hundred dollars from a U. S. society, while our Canadian Government in no way recognizes the great work he is doing. It does not even give him protection against the pranks of people who try to frighten away the birds that he has taught not to fear man.

Mr. Miner made many friends at the O.A.C., not only for himself, but for his loved birds, and we join with him in the protection of our native and beneficial species. G.E.D.

MACDONALD HALL VS. ALPHA LITERARY SOCIETY.

The glittering roofs are still with frost; each worn

Black chimney builds into the quiet sky
Its curling pipe to crumble silently.

So sayeth the poet Lampman and the same might have been said of Saturday evening, February the tenth, the evening set aside for the semi-annual meeting of the Mac Hall and Alpha Literary societies. We might say further that the prevalent presence of "Jack Frost" made conditions such that there was shivering, chattering of teeth and clamorous squeakings of shoes as the audience assembled in Massey Hall at eight o'clock. The Alpha President, Mr. Maxwell, occupied the chair and, with the assistance of the Macdonald executive, must be congratulated on the excellent programme prepared.

The chief item of the programme was a lively discussion of the subject resolved,—“That the Tobacco Plant has been a curse to humanity.” The representatives of the Macdonald Society, Misses E. Ruttan and M. Wark.

sallied forth with a grim determination to banish once and for all the filthy weed which might prove fatal to the health of their future husbands. The Alpha supporters, Messrs. J. Hempson and A. W. McKenzie seemed to place full confidence in the old adage that "it is better to smoke here than hereafter." The negative speakers argued that the plant in itself was no more harmful than the "peculiar, periodical, plastic pancake" and therefore had no more right to be condemned. The affirmative, however, seemed to voice public opinion when they pronounced it a curse to humanity because of its filthiness; its evil effects to the human constitution; the enormous expenditure of money and that to no cause; and the devastation of public property as a victim of the cigarette stub.

The other members of the programme catered more largely to our aesthetic tastes. A vocal solo by Mr. P. L. Fancher was highly appreciated. Miss Kruspe in a reading paid a tribute to our brave soldiers and even went so far as to say "there is always something doing when a freight train meets a cow." A vocal solo from Miss B. Jackson received much applause. A couple of selections on the victrola concluded the musical part of the programme for the evening. In the selection of the judges it seems the president realized that the ladies were about to receive the franchise and for the first time we had a lady judge at a Literary meeting. Dr. Annie Ross represented the ladies as judge, while Prof. G. E. Day and W. H. Scott B.S.A., represented the men. Prof. G. E. Day also acted as critic and gave the judges decision in favor of the affirmative. The singing of the "National Anthem" closed the meeting before the president had time to smoke

the cigar presented to him by Mr. Hempson, the leader of the negative.

SOPHOMORES VS. SENIORS.

We'll not confer with sorrow

Till to-morrow;

But joy shall have her way

This very day.

So thought many, from MacDonald Hall, O.A.C. and the city as they wended their way to the Massey Hall, on the beautiful, balmy spring-like evening of February 17th, to enjoy the excellent program rendered on that occasion.

Many of the less timorous members of all years, with commendable spirit, did not go alone, and, needless to say, spent a pleasant time with those especially qualified to entertain. President Austin graciously condescended to allow a few minutes in the form of an intermission which was much appreciated by the blondes and brunettes.

The orchestra in their usual style rendered four numbers, which were much appreciated. Miss Kennedy showed that the female mind was superior to the males because after being worsted in a quarrel the man had to admit he still loved woman. As an encore Miss Kennedy gave us a Scotch sermon. The audience was much impressed by her ministerial qualifications and would be delighted to hear her on more than one future occasion. Dr. Stevenson gave an illustrated talk on the songsters of the great out-doors, which was instructive, interesting and altogether enjoyable.

But the feature of the evening was the debate between the Sophomore and the Senior Years. The subject was: "Resolved that the female mind exerts a greater influence upon the civilization and happiness of the race than does the male mind." Much weighty matter

was presented by the speakers—Messrs. R. W. Oliver and J. S. Steckle for the Sophomore Year (affirmative) and Messrs. P. L. Fancher and I. B. Martin for the Senior Year (negative.) The negative argued that man's anatomy had felt a deficiency ever since woman was created, while the affirmative were willing to endure the loss of a rib to have woman as a companion.

However, after weighty consideration and due deliberation, the judges, Prof. W. H. Day, Mr. H. L. Fulmer and Mr. H. M. King gave a unanimous decision in favor of the negative. After singing the National Anthem all dispersed, regretting exceedingly that this was the last meeting of the Union Literary Society for the Winter Term of 1917. T.C.

"SOPHOMORE BANQUET," YEAR NINETEEN.

This occasion, unhappily the last on which the Sophomore year can ever be all together, had been looked forward to expectantly for some time. About 6 o'clock on the night of Friday, the 16th, wondering visitors of the Kandy Kitchen saw the fellows come into that well-known establishment and, disdaining all enticements below, march bravely upstairs to the better treat in store.

As our honored guest, Dr. Creelman, started us on our way, we noticed that the year was very well represented at the table. Even our long absent friend Caldwell decided to leave the charming nurses at the hospital and come to do his bit. Our only regret was that we couldn't have our 'Munny' with us, but he was not entirely forgotten and there were some persons who received a surprise that night, not only at the light lunch that was taken up to the invalid later, but at the ready way in which he took to it.

The Committee had done their work well, even to including oysters in the oyster soup. The menu, as everyone agreed, was simply "swell"; but why dally? there wasn't a man who didn't do his share, alike with roast turkey and plum pudding "Made in England—Furnished in Canada" as with the enchanting fruit punch which called to mind fond memories of days gone by. Nothing was forgotten, even to matches for the restful smokes handed out afterwards; nothing was forgotten and, we might add, little more was left.

Wonderfully refreshed at the close of the banquet every member of the year was able to arise, lean on his chair and respond nobly to the different toasts proposed. Pres. Stillwell proposed the toast to the King; after his health was drunk the National Anthem was sung right lustily by everyone present.

"Dad" Stewart next proposed a toast to "The boys at the Front." Over 440 O.A.C. students have enlisted and 37 had fallen in defence of King and country; 36 of our own year are in the army and one of the number Bomb. R. Bews has made the supreme sacrifice. "May we be worthy of them!"

Dr. Creelman said he was always glad to be at a Year Banquet as it brought him into closer touch with the boys, closer even than he usually is with Mill St. He told us of the high record that had been established by the "College" Battery, and felt sure that though its identity was now lost due to its being split up, yet that it might be for the best after all for it would now improve two other batteries. Year Nineteen even when in England still showed that it "could put one over on the other fellows"—didn't they, Gardie? A bit of fatherly advice as to the desirability of getting up

to the dance at the Hall as soon as possible concluded the speaker's remarks.

"Tommy" Atkin now spoke of the great things that the college and its students and ex-students were doing. After citing a few of the benefits derived from college life, such as learning quiet and order on Mill St., he proposed a toast to "The future success of the College."

"Alex" Brink after regretting his inability to speak in proportion to the recent spread told us of another banquet that came to his mind, on which however being a stage scene we'll let down the curtain. We can't fully appreciate at present the work the college has done but as we leave we see more clearly its true value. He concluded his remarks by telling of the place agriculture has in the world.

Musgrave, all-round athlete and scholar, next rose to propose a toast to "The Year." Our year has had a fair measure of success in all the different branches of College life; our good fortune in being able to secure Prof. Squirrell as our Hon. Pres. has had a great deal to do in this respect, for not only has he given us advice in our lectures but he has helped us by hints in all our athletics.

Prof. Squirrell in responding said he was proud of the showing the year had always made. The results at the Xmas Exams were the best of any Sophomore year and he wished us

continued success. This meeting would be the last at which some of the year would be with us but he advised us to keep in touch with one another even after we had left. We were to remember that we would be closely watched on going back to our homes but that should never keep us from doing what we thought would be an improvement on the old methods.

To Pres. Stillwell's surprise it fell to the lot of our shy comrade, Roy Allan, to propose the toast to the ladies. However Roy, in spite of having it forced on him, didn't do at all badly considering his inexperience.

"Man was God's first thought, woman his second.

Second thoughts are always best, so here's to "The Ladies."

Jack Shales, in spite of being a proverbial non-fusser, responded nobly. In flowery language he expressed the undoubted sentiment. "The ladies, we love them all." He then extended a pressing invitation for us all to come with him to the fair ones waiting on the heights.

Pres. Stillwell representing the year then presented Prof. Squirrell with a splendid meerscham pipe as a mark of the esteem in which he was held. Prof. Squirrell in a few well-chosen remarks thanked the year for the gift. The National Anthem was then rendered, after which the fellows left for Mac Hall to keep Jack from becoming lonesome. G.S.G.

MACDONALD

A GRAND SUCCESS.

Perhaps the most enjoyable social function of the year, for the students of Mac Hall and the O.A.C. was the Third Year Dance, given on the evening of Feb. 16th.

For the occasion, the gymnasium was tastefully and appropriately decorated with pennants, flags and bunting in the ever popular and patriotic colors of red, white and blue; while a garden of palms was arranged for the musicians.

most continuously until midnight with only a short intermission for refreshments. Many were the regrets when the evening came to a close and many are the hopes for a repetition in the not-too-distant future.

The work of those in charge, who must be complimented on their efficiency, was well repaid by the evening's enjoyment, as well as by the realization of over one hundred dollars, to be donated to Red Cross Funds.



WHEN HEELS ARE HIGH

Early in the evening the guests began to arrive, while around the 'Well' beamed happy smiling faces, showing appreciation of the rare treat in store. Soon programmes were filled and all were lured by the entrancing strains of Cronk's Orchestra to enter into the delights of the waltz. Everyone was in a gay mood befitting the occasion and dancing was kept up al-

"WHEN HEELS WERE HIGH."

"It is enough! Earth's struggles soon shall cease,

And we be called to Heaven's perfect peace!"

"Amen! I'm going to have a heel parade this morning." An outsider would wonder how this seemingly innocent remark could cause such looks of dismay. Here and there one could

see the more frivolous ones taking a last fond look at their best boots. The school was divided into plainly anxious ones, the slightly nervous, and the complacent ones. The last had a feeling of satisfaction as they looked at their "sensible" shoes—which restore broken arches, do good work in the apartments and make women walk as they should.

Retreat was impossible! The attacking party ambushed itself at the foot of the narrow pass leading to freedom, and the captives passed in single file. Not many escaped the onslaught. "Let me see your heels!" "Take off your rubbers, I can't see!" "One more lift and you'd be gone, Miss —!" "Yours were high, once, Miss —, the worst kind!" "Go to the left

of me!" And the weary ones come on. The casualties were heavy and many of our best shoes are on show for a month in the cupboard. The unhappy girls went over to Mac Hall and returned with shoes in their hands, and Watson Specials on their feet. A stranger would have appreciated the willing spirit of the victims as the loot was gathered in. "Here they are Miss Watson. I'll wear low heels, but I can't walk!" "Don't talk to me of high arches; I know more about them than you do!"

Every cloud has a silver lining and though well disguised this time, we realize that our shoes will be in splendid condition for Easter and so everybody is happy.



QUERY.

What's the matter with Campbell? He never rested quietly, after the dance at Hespeler, until he got back again for a week-end.

* * *

Was that Mac girl really frightened by the large bovine that looked at her as she came from the rink on a recent Saturday, or did she merely want to give "Whitey" Oliver a chance to prove himself a hero? Oliver acquitted himself heroically anyway.

* * *

A by-stander remarked that the flip young damsel on the road was a "laughing-stock," but we are of the opinion that the animal by the barn was the laughing stock.

Butlers, year '20, has just emerged from a three weeks vacation in the hospital. He is much improved in health and it is reported that he gained 136 pounds—all at once— which he contemplates taking back to B.C. in April.

Wadsworth, (discussing war between South and North.)—My grandfather fought in the American Civil war.

Stillwell—On which side?

Wadsworth—On my mother's side.

IN THE DAIRY CLASS.

Travis (Lecturing on the separators).—Now gentlemen you will notice that the separator bowls of large diameter are usually shallow in depth while



LEST HE GROW FIERCE, YE FRESHIES. DISTURB HIM NOT!

this bowl of the Tubular machine is ver narrow and long. Can any of you explain why it is so long?

Gregory—Please sir, it is made long so it will reach to both ends of the machine.

Prof. W. H. D. (calling the roll at Physics lecture).—Mr. Allan?

Roy Allan—Here sir!

Prof. D.—Mr. Almey.

Bob Almey—Heah!

Prof. D.—Where is Mr. Almey?

Bob Almey—Heah I am!

Prof. D.—Mr. Almey, where were you born?

Bob Almey.—In Ontario.

Prof. D.—All right, but you must have met with an awful accident.

S--b--k.—Oh! for my "Soule." I cannot sleep a wink.

It is reported that Cook, when admitted to the Isolation Hospital, was found to have not only the measles but several articles of ladies' jewelery on his person.