

Volume XXVI.

Number 9

O.A.C REVIEW

JUNE



1914

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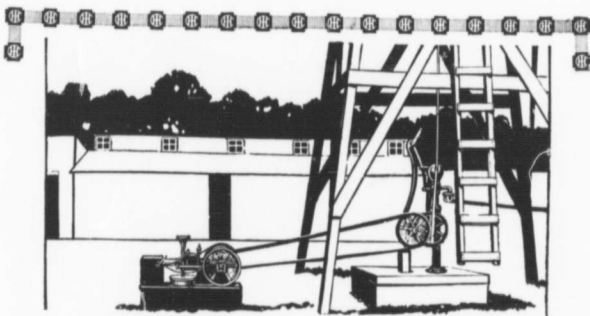
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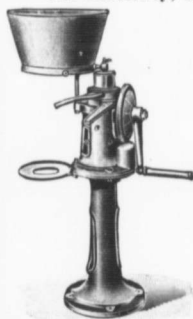
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HON. J. S. DUFF,
Minister of Agriculture, Toronto, Ont.

H. A. MACDONALD,
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THE EDITOR'S PAGE

The Apostle of Drainage.

IN FENELON Township twenty-six years ago a seventeen-year-old lad without means or expectations set out in life for himself with the fixed intention of following an educational career. To-day the same lad, now a man in the prime of life, has attained his ambition and is Professor of Physics at the Ontario Agricultural College, the best college of its kind in the world. Courage, energy and a pleasant gift of humor, combined with a brain as practical as it is scientific, have placed him where he is and will carry him further.

Eight years of painstaking observation and experiment, eight years collecting of all the data obtainable, practical and theoretical, have enabled Professor W. H. Day to prove beyond all cavil the efficiency of lightning rods both as carriers and preventers of shock. If any man could take off his coat and rod a building to perfection it is this genial lecturer with the keen eyes, the spectacles and the cheery smile.

But if his work on lightning has been his hobby, he has by no means neglected other features of agricultural physics. When the dark eyes of Mr. W. H. Day first blinked at the light at Fenelon in 1871, rest assured that drainage was the main object of his infant mind, and that the feeding bottle was soon as dry from his efforts as are to-day the thousands of acres of erstwhile, sedgy swamp, where once the frogs chorused and bitterns boomed across the watery silences.

Professor Day has organized and controlled one the most beneficent schemes ever put forward by Government for the advancement of agriculture. Every spring under his guidance goes out throughout Ontario a band of youthful apostles of drainage preaching its advantages to farmer audiences and carrying out practical surveys wherever their aid is applied for by the farmers. The farmer receives free of cost a well drafted plan showing cost, gradients and tile systems and all needful information for the ditching contractor. Not only bogs and sloughs are emptied, but sour land is becoming sweet and wastes are producing bumper harvests at a touch from the magic wand of Professor Day.

The lad who fought his way up the ladder of success rung by rung as a school teacher in Victoria, Oxford and Simcoe counties; who worked his way through Toronto University and graduated as a gold medalist in physics with an honors degree in mathematics, is now a prominent agriculturist and a man of importance in the eyes of the public. Money he treated not as an end but as the means to an end. His ambition was service, not the rulership acquired by the amassment of millions.

As a commercial man Professor W. H. Day would have been a success as success is measured by modern worshippers of the golden calf. But earning little better than the salary of a third-rate jockey he is wealthier far as he counts wealth than the fattest-paunched of plutocrats. He has a wife, children, position, a comfortable home, hosts of friends and the vow that he made to himself at seventeen has seen its fulfilment.

THE O. A. C. REVIEW

THE DIGNITY OF A CALLING IS ITS UTILITY

VOL. XXVI.

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No. 9.

The Illinois Soil Investigation

By H. C. WHEELER

SINCE this article follows one entitled "The Illinois Soil Survey," mention of the object of these soil investigations seems unnecessary. The work of investigation includes the soil survey, soil sampling and analysis, and the cultural experiments conducted on many fields throughout the state. For the purpose of this article it also may be said to include the work of extension by which the University strives to place the available information before every landowner, that he may know what crop rotation should be practised, what elements of plant food supplied, where the cheapest and best carriers of these elements may be obtained and how they may be applied.

The work of collecting soil samples from a country is begun soon after the soil map is completed. All samples are taken under the direction of one or more of the men who are at the head of the several divisions of soil investigation work. They are aided by men from the division of soil chemistry and by such men of the survey as are most familiar with the soils of the country from which the samples are collected.

Since the object of sampling and analysis is to obtain an invoice of the plant food contained in each type of soil recognized in the survey, great care is exercised to secure

samples which are truly representative. The plan has been to collect only a limited number of samples. This number must however be sufficient to adequately represent every soil type and any great variations within each type. A 1½-inch auger is used for sampling. Separate samples are taken of surface, subsurface and subsoil and careful note made of the location of the place of sampling.

The soil analyses are made to determine the amounts of total nitrogen, phosphorus, potassium and magnesium in each soil. Tests are made to determine acidity and the amount of limestone required to correct that acidity. All results are computed in pounds per acre. These facts serve as a reliable foundation upon which to base methods of soil treatment for systems of soil improvement.

Experiments are now being conducted upon thirty-four fields located upon some of the principal soil types of the state. Various rotations are practiced and the plant food elements are applied singly and in combinations. The object is to determine what plant food elements can be purchased and applied with profit rather than to test the relative value of the numerous carriers of those elements. It is believed that the long continued experiments at Rothamstead, Eng., as

well as the more recent investigations at the Ohio, Pennsylvania and Maryland stations furnish conclusive facts as to these points.

In addition these fields are now devoted to a study of the relative importance of certain physical factors which have to do with the improvement of the soils under investigations. Chief of these is the study of surface washing and methods of prevention.

Although the Illinois investigations can not be considered as complete, yet a great amount of reliable data has been obtained upon which to base positive conclusions as to the best methods of improvement for almost every type of soil in the state. Only a few examples can be given in the paragraphs which follow.

The University North Farm at Urbana is located on brown silt loam of the early Wisconsin glaciation. This brown silt loam is the common prairie soil of the corn belt. Analyses of a large number of samples of the surface soil of this type show a total nitrogen content of 5050 lbs., a total phosphorus content of 1190 lbs. and a total potassium content of 36,250 lbs. per acre.

A three-year rotation of corn, oats and clover was begun on this field in 1902 and plant food elements applied singly and in combinations. Returns from a livestock and a grain system of farming when taken together show that during the first rotation phosphorus increased the crop yields per acre by .68 tons of clover, 8.8 bushels of corn, and 1.9 bushels of oats. During the second course of the rotation the increase was .79 tons of clover, 13.2 bushels of corn and 11.9 bushels of oats. During the third three years or third course of the rotation the increase for phosphorus was 1.05 tons of clover 18.7 bushels

of corn and 8.4 bushels of oats. The average cost of this treatment per rotation was but \$7.39. The reader can figure the profits according to his ideas of the market value of the crop increases.

Similar results have been obtained from other fields located on this type of soil. Eleven years' results from the Bloomington field show a net profit of \$62.42 per acre for the use of phosphorus.

The soil experiment fields at Odin, Cutler, Fairfield, Du Bois and Ewing are located on gray silt loam on tight clay, the common prairie soil of the Lower Illinoian glaciation. The analyses of a large number of samples of the surface soil of this type show an average of 2,880 pounds of total nitrogen, 840 pounds of total phosphorus and 24,940 pounds of total potassium per acre. Analyses also show that an application of two to five tons of limestone is necessary to correct the acidity.

At Fairfield where a rotation of corn, cow peas, wheat and clover is practiced, the crop increases during the first rotation, due to the use of lime and phosphorus, more than paid for the application of limestone and rock phosphate while the increase in the clover crop alone during the second rotation was more than sufficient to cover the cost of the soil treatment thus leaving the increases from other crops of the rotation as net gain. Similar results were noted at Odin, Cutler, Du Bois and Ewing.

As an average of many tests on the acid soils of the experiment fields of Southern Illinois it has been found that the value of the crop increases due to the use of limestone has been four times the cost of the application of that material.

Some of the best known work is

that on peaty swamp soils. Deep peat has been found to contain 35,000 lbs. of nitrogen, 2,000 lbs. of phosphorus and only 2,900 lbs of potassium in one million pounds of surface soil. The use of potassium on the peaty swamp soils of the mineral field has in nine corn crops returned a total increase of a value of \$140.56. The cost of the potassium sulphate used was but \$34.72, and the return 372 per cent. on the investment.

The plan has been to recommend that plant food be supplied in the cheapest form or the form which will give the greatest returns for the money invested. The finely ground rock phosphate is recommended as a source of phosphorus and ground limestone to correct soil acidity. The railroads of the state have granted a special low rate on these materials.

A soil report will be published for each county. It will contain the county soil map, descriptions of the soil types and data from analysis and from cultural experiments with recommendations as to profitable methods of progressive soil improvement such as will permanently maintain the fertility of the soils of that county.

The county agricultural advisor is proving to be a valuable agent for the distribution of information and the University has recently seen fit to employ one man in soil extension. His efforts are directed to personal work with the landowners of the acid soils of Southern Illinois.

All of this work is done at great cost but it is believed that the cost will be many times repaid in the future prosperity of the state.



THE ONION HABIT OR BE CONSISTENT

There is something funny about the onion habit, anyway. When a man courts a girl who prefers raw onions to Maraschino cherries, he will snuggle up beside her in a hammock six nights a week and steal a kiss with the utmost composure. If she offers some apology about onions being good for a cold in the head, he will declare that he hadn't noticed it at all and tell how strict a vegetarian his father was. But after a man gets married, if his wife eats one puny young onion for supper and then kisses him on the left ear, in an apologetic way, he will ask her if she hadn't better chew a few cloves and borrow a little of the hired girl's perfume. Many a man will pull on an old, black pipe all day and come home and fill the lace curtains with the fumes of Track Walker's Delight, but if anybody in the family slices a few early-rising onions in vinegar and proceeds to devour them he will open all the doors and windows and bawl for fresh air. Consistency, thou art a peach!

A Treatise on Farm Bookkeeping

Prepared for the Department of Economics,
Ontario Agricultural College

BY J. E. LATTIMER, B.S.A.

INTRODUCTION

FARM bookkeeping is an uncultivated field. Stricter attention to the business side of the industry would do more than any other single thing to make farming pay.

More than fifty years have elapsed since Horace Greeley observed that if every farmer would devote two hours of each day to reading and reflection there would be fewer failures in farming. The recent report of the Commission on Country Life of the United States, says: "The excessive hours of labor on farms must be shortened." It is plain that this criticism, though not new, applies to conditions in this province. The excessive hours of labor on the farm can be profitably shortened by employing some of the time usually spent in muscular labor in keeping accounts. Farmers are often better workers than business men and in many cases the lack of bookkeeping is losing more for them than their long hours of toil are making. This statement is borne out by the consideration of the facts and figures presented by Professor W. Warren, in Bulletin 295, of Cornell University. These figures show the great difference in income from contiguous farms in certain townships of New York State under different management. A similar survey of any section of this province would show corresponding results.

Bailey's Encyclopaedia of Agriculture points out that more farmers fail from lack of business methods and proper records, than from ignorance

in handling land, plants and animals and making them pay. The relation that cost bears to gross income and to net profits is too seldom considered by the farm manager. Sir Horace Plunkett in the Rural Life Problem of the United States writes: "I fear it cannot be denied that in the application of economic science to the business of farming the country folk are decades behind their urban fellow-citizens. There must be better farming, better business and better living but better business must come first."

Those who have given rural conditions much study are apparently agreed as to the value of farm bookkeeping. Why then is it not more generally practised? The *Farmers Advocate* in a recent editorial emphasizes the fact that the amount of business management given to the average farm is ridiculously small. Granted. The amount of bookkeeping done on the average farm is nil.

There are various reasons for this—the complexity of the business, the various lines followed, the difficulty of working out a cost system, overlapping from one year into another rendering an exact annual stock-taking hardly possible, the trouble of reckoning the portion that may be fairly charged to capital account for improvement or depletion of the soil from year to year, these are some of the difficulties that make farm bookkeeping rather hard. On the other hand there are some things that render accounts simple. The farmers selling is a cash business. His buying is largely on the same basis.

Therefore, those transactions are easily kept account of. Further, there are periods in the winter months when time is not valuable that stocktaking as well as the major portion of the work can be done.

The introduction of a cost system has of late years, revolutionized manufacturing and commercial life. The farmers need cost records as accurate as the manufacturers. It may be advanced as an objection that the farmer is too busy to adopt such a system of bookkeeping. This trouble is avoided to a great extent by providing for the bulk of the work of reckoning the cost of production being done in the winter months. Bookkeeping, including some form of productive costs, is coming into favor. Professor Warren finds from a study of this question in one county in New York State, that forty-seven per cent. of the farmers kept some accounts of receipts and expenses. In this same county, there were two farmers who kept accurate cost accounts. The fact is that cost accounting is used by very few people, *but this method of studying the business is rapidly increasing.*

It is said that the difference between a farmer and an agriculturist is that to be the latter all one needs is a pencil and paper, while to be the former requires the plough, harrows and other paraphernalia. But with all the ignominy heaped upon the theorist it is now an accepted fact that nothing pays better than spending some time on farm accounts.

SCOPE

The scope of Farm Bookkeeping should include:—

1. INVENTORY.
2. BUSINESS TRANSACTIONS.
3. COST OF PRODUCTION.
4. TRIAL BALANCE.

INVENTORY

By many farmers interest on capital invested has been a neglected factor. Indeed in the past, the interest on the sum not invested (by them) has been all that worried some. But with the increasing value of land, stock and implements, interest on investment is a matter of increasing importance. Allowance for depreciation of plant must be considered in the inventory. An allowance of ten per cent. has been given by many authorities. This has been applied to work horses and implements. The writer's experience has shown that this can be considerably reduced by proper care of these two essentials in equipment. It is not a hard matter to supply a farm with work horses with less than a ten per cent. allowance for depreciation and less than that will be sufficient for depreciation in implements where they are properly housed.

The labor cost of products, allowance for depreciation and interest on capital must be considered in order to economically equip a farm with modern machinery. Where these three points are not considered equipment often runs riot and over capitalization is the result. Where the average size of farms is one hundred acres, figuring on the above points may show that co-operation in the owning of some implements is cheaper and fairly satisfactory. There is shown here an example of the inventory of an ordinary one hundred acre farm where mixed farming is carried on.

INVENTORY—TIME FOR STOCK-TAKING.

The time may be arranged to suit the convenience of the manager. January first is not a particularly busy time on the farm. March first, has been recommended as a time when there was less feed to be valued. Pro-

bably the time when there is the least Stock-taking then would therefore be simple.
stock, grain and feed on hand is June.

INVENTORY

ITEMS	
Farm—100 Acres	\$7000 00
Horses—3 at \$150 each	450 00
Cows—5 at \$60 each	300 00
Other Cattle—10 at \$30	300 00
Brood Sow	25 00
Shoats—15 at \$5.00	75 00
Chickens—50 at 50c each	25 00
Grain in Barn	158 00
Hay	80 00
Straw and Corn Fodder	20 00
Roots	42 00
Grain in Ground	100 00
Farm Implements	300 00
Tools and Utensils	25 00
Building Material	20 00
Miscellaneous	35 00
Cash on Hand	45 00
TOTAL	\$9000 00

DAY BOOK

A small pocket memorandum will serve admirably for business transactions. But to tabulate data enough to enable the cost of production to be reckoned needs something more. There is given here a blank form with the space reserved for a complete diary of the farm for the day. One page will be used each week. Five minutes daily will fill in this blank and will en-

able one later and at more leisure to work out the cost of production of all farm products.

CASH BOOK

A cash book with separate columns, as the example given shows, gives an opportunity of classifying accounts and serves the purpose of the ordinary ledger. The work of preparing a financial statement is simplified by this method.

DAY BOOK—CASH BOOK

The Day Book and Cash Book can be kept with a minimum of labor and will furnish the necessary data for a financial statement at any time. These books should furnish the required information for working out the cost of any product. For this more complicated bookkeeping, a ledger may be used and the items transferred to this from the day book when time is allowed.

LEDGER

To this book we may assign the accounting of the cost of the various farm products. We give here the probable cost of horse labor, examples of cost of production of crops, bacon and beef. As will be observed there may be as many different results obtained from figures on cost of production as there are men producing. And there may be a difference in cost of producing the same article each year. Yet, the most accurate estimation possible is necessary if the farmer is to find the most profitable branches of his work.

A strict record of time and labor charges against each individual farm product would afford some surprises

to the most skilful farm managers and be of inestimable value in locating the leaks. A record of labor charged to every undertaking would also eliminate largely the lost time which is no small item on many farms.

Shorter hours of labor, yet more accomplished must be the slogan. This can be achieved by conserving the zeal wasted through unprofitable endeavor in not knowing exactly which branches of farm operation pay best, and which, if any, are conducted at a loss.

PRODUCTION COSTS

The cost of horse labor and production of grain crops, beef and bacon have been taken from the writer's figures. The figures on horse labor and crop production compare closely with those given by the Minnesota Experiment Station, except where more extensive methods were followed, as on the large farms of Minnesota. All that is aimed at here, however, is to show a simple method of arriving at the cost of production. For tabulating the figures required for this a loose leaf system of blank forms is convenient.

COST OF HORSE LABOR

10 bu. Oats at 40c.....	\$ 30 00
2½ Tons Hay at \$8.00.....	20 00
1 Ton Straw.....	6 00
Total Cost of Feed.....	56 00
Labor ½ hr. per day at 15c per hour.....	27 38
Shoeing.....	3 00
Interest on Investment.....	7 50
Deterioration 5%.....	7 50
TOTAL COST	\$ 101 38
4 Tons Manure at \$1.00 per ton.....	4 00
Cost of maintaining one horse one year.....	97 38
Average hours worked by farm horses per year.....	1200
Cost per hour of horse labor.....	8.5c

COST OF RAISING WHEAT AFTER CLOVER HAY—

Plowing Ground—3 horse plow, per acre.....	\$ 1 17
Preparing Seed Bed and Seeding.....	98
Seed—2 bu. per acre, at \$1.00 per bu.....	2 00
Implement cost per acre, 75c.....	75
Twine.....	30
Harvesting and Stooking.....	54
Hauling to Barn.....	92
Threshing.....	1 25
Interest on Seed Cost.....	10
Total Labor Cost per Acre.....	9 96
Rent of Land.....	4 00
Manure from Previous Crop.....	2 00
Total Cost of Production per Acre.....	\$14 01
Rotation followed was roots, barley, clover, wheat.	
Manure was applied for the roots. The division of charges of manuring different crops is first crop 40%, second 30%, third 20%, fourth 10%. Accordingly 10% was charged to wheat in this particular case.	

COST OF GROWING SPRING GRAIN—

Ploughing, per acre.....	\$ 1 07
Spring Seeding, per acre.....	1 10
Seed—2 bu. per acre at 50c per bu.....	1 00
Implement Cost per acre 75c.....	75
Twine.....	20
Harvesting and Stooking.....	50
Hauling to Barn.....	63
Threshing.....	80
Interest on cost of Seed per acre.....	05
Total Labor Cost per acre.....	6 10
Rent of Land.....	4 00
Total Cost of Production per acre.....	10 10

THE O. A. C. REVIEW

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COST OF PRODUCING BEEF

No. 1. 1908. Bought 4 Steers, \$129.00 (Yearlings)	\$ 32 25
Interest on Investment for 200 days at 5%	90
200 days, ½ bu. turnips per day at 6c per bu.	6 00
200 days, 5 lbs. Hay per day at \$6.00 per ton	3 00
200 days, 10 lbs. Corn Fodder per day at \$4.50 per ton	4 50
150 days, 5 lbs. Chop per day at \$1.25 per cwt.	9 38
Labor—53.5 hours at 15c per hour	8 00
TOTAL	64 03
4 Tons Manure at \$1.00 per ton	4 00
Total Cost	60 03
May 20, 1909. Sold 4 Steers, average weight 1040 lbs. at 6c per lb.	62 40
Cost of Production	60 03
Net profit per Steer	2 37

COST OF PRODUCING BACON

JUNE 5. Bought 6 pigs, six weeks old at \$3.00	\$ 18 00
30 lbs. Skim Milk per day.... at 20c per cwt. for 75 days	5 00
12 lbs. Chop per day..... at \$1.25 per cwt. for 100 days	15 00
25 lbs. Choꝑ per day..... at \$1.25 per cwt. for 50 days	15 63
Labor, drawing hogs home and purchasing	2 00
Labor, Feeding—15 minutes per day at 15c per hour, 150 days	5 70
Labor, Shipping Hogs	1 50
Weighing Hogs	10
Interest on Investment	45
Pasture	3 00
TOTAL	66 47
2 Tons Manure at \$1.00 per ton	2 00
TOTAL COST	\$64 47
Nov. 2. Sold 6 Hogs, weight 1210 at 7c	84 70
Net Profit	20 23
Profit per Hog	3 37

Trial balances of two consecutive years are given here. These figures are taken from the writer's books. They show the necessity of a record of the business of farming extending over more than one or two years if it is to be of much value. There are two main reasons for this. FIRST—The varying production and prices. SECOND—The most accurate inventory where grain and feed are charged at market price and afterwards fed will not give each year its just dues. For these reasons a record for a number of years transactions and the average income taken therefrom gives a clearer idea of net income.

EXTENDED BALANCE SHEET

The example given is from the writer's books for the years mentioned.

These figures look small at the present time as prices of farm produce were small in those years compared with the prices now prevailing. Further, in these figures no account was kept of the milk, butter, meat, eggs, fruits and vegetables that were used by the household. These figures are therefore independent of the above mentioned goods whose cash value would be between \$150 and \$200.

A record of farm receipts covering a period of years on one page shows at a glance the strong and weak departments when taken one year with another. Any experiment in farm production is of questionable value unless it covers a period of five years. Similarly a record of farm operations covering a number of years is more valuable than one only a short time.

TRIAL BALANCE—1908			
Inventory.....	\$ 8925 00	Interest on Capital at 5%.....	\$ 446 25
Receipts.....	1471 56	Farm Expense.....	504 00
		Inventory.....	9075 00
		Net Income.....	371 31
	<u>\$10396 56</u>		<u>\$10396 56</u>
TRIAL BALANCE FOR 1909			
Inventory.....	\$ 9075 00	Interest on Capital at 5%.....	\$ 453 75
Receipts.....	1361 46	Farm Expenses.....	364 97
		Inventory.....	9000 00
		Net Income.....	887 74
	<u>\$10706 46</u>		<u>\$10706 46</u>

ANNUAL RETURNS—

Year	Total Income	Wheat	Coarse Grains	Hogs	Cattle	Dairy	Poul'y	T'nips and Pota's	Sundries	Farm Expenses
1905	\$1282 68	\$259 88	\$294 35	\$268 10	\$154 50	\$124 80	\$101 35	\$ 81 01	\$95 05	\$263 45
1906	1231 45	148 80	182 02	263 75	278 00	118 40	106 80	26 98	63 10	591 27
1907	1738 64	355 25	280 76	280 75	440 00	120 20	79 80	107 73	64 25	307 19
1908	1471 56	506 46	172 85	304 45	219 00	132 60	69 40	12 20	45 00	504 00
1909	1631 46	470 50	154 20	346 80	326 75	114 96	90 00	12 95	45 10	364 97

TRIAL BALANCE

1905 Inventory.....	\$ 9000 00	1909 Inventory.....	\$ 9000 00
Av'ge Income, 5 yrs.....	1475 15	Interest on Capital at 5%.....	450 00
		Average Farm Expense.....	406 17
		Average Net Profits per year.....	614 98
	<u>\$10471 15</u>		<u>\$10471 15</u>

This system of bookkeeping will give a full account of all farm operations, a detailed account of business transactions, and the data to figure the cost of all farm products. It will enable the reckoning of the cost of production to be done at leisure moments thus making a minimum demand on the farmer's time in the busy season.

ADVANTAGES

The advantages of the general use of such a system would be many.

1. An exact account of the receipts and disbursements prevents losses from accounts being rendered a second time. Thus they often pay in actual cash for all time spent on keeping books.

2. A diary of farm operations would be valuable for future guidance in management.

3. Unprofitable labor would be reduced to the minimum.

4. The "star boarder" would be removed from the dairy herd.

5. The type of steer that did not respond to liberal rations would become more rare.

6. Work that could be done in the winter time when labor is cheap would not be so frequently left for the busy season.

7. Two-horse teams would become more of a novelty in the fields of this province than at present.

8. Cheaper production would increase farm profits.

9. Better business methods would have a far reaching effect on such questions as:

(a) THE FARM LABOR PROBLEM.

Attention to cost of production would insure a better direction of labor and lead to the better use of a scarce article.

(b) RURAL DEPOPULATION.

The farming industry is today under-manned. Better business methods will insure greater profits. This will do a great deal to stop the rural exodus.

(c) THE HIGH COST OF LIVING.

Already our market is invaded by farm products from the United States, the Argentine, Denmark and Australia. If our farmers are to hold our own market they must produce more cheaply or see that their goods are distributed more economically.

(d) DISTRIBUTING CHARGES.

More information on the cost of producing farm produce would show that present high prices of these products are not due to the farmer's large profits. Present high retail prices are due to our costly method of distribution. Better systems of marketing would be developed.

SUMMARY

(1) The increasing complexity of farming demands greater attention to farm bookkeeping. In the past this matter has been seriously neglected.

(2) The business transactions of the farmer are done almost entirely on a cash basis. Therefore this part of his bookkeeping is simple.

(3) Some method of obtaining the cost of production of all farm products is necessary.

(4) Lack of time and stress of labor are the chief reasons why more attention has not been paid to this in the past.

(5) The simplest plan is the best plan. If too much is undertaken all will be neglected.

(6) The system here outlined overcomes the objection of the lack of time. The essential point is to provide suitable blank forms on which to record required data. A few minutes daily will provide the information to work out cost of any article.

(7) The time to take the annual inventory and to reckon the cost of production is available in the winter months.

(8) The inventory and trial balance are essential to estimate the year's operations. A record covering a period of years is valuable to get a fair idea of farm profits.

(9) The value of a record covering a number of years is a great stimulus to further effort. Under its cumulative influence greater future possibilities are revealed.

(10) Farm accounts that would show farm profits would clear many misconceptions on the question of rural depopulation and the high cost of living that are today causing people such serious alarm.

REFERENCES

- Encyclopaedia of Agriculture.—Bailey.
 Farm Accounting.—Bexell.
 Farm Management.—G. F. Warren.
 Farm Accounts.—J. A. Vye.
 Farm Management—F. W. Card.
 Bulletin 295.—Cornell.
 Bulletin 73.—United States Department of Agriculture.

AGRICULTURE

The Two-Day Stock Judging Course

The following article is written by F. D. Shaver, one of last year's graduates. He is at present Assistant to the Superintendent of Institutes and from his close association with the farmers and farming conditions of Ontario may be considered an authority on this subject.—Editor

It should be the aim of every man or boy to become a competent judge of live stock if he expects to be interested in any way in the production or handling of domestic animals.

Some of our prominent business men of the cities take up, as a hobby, some class of live stock and become expert judges and breeders for pleasure. These men are successful breeders because they have become good critics of the class they are breeding and are able to detect the defects in their best stock and eliminate the undesirable characters by selection. Bakewell's success as an improver of live stock was due to the fact that he was an expert judge. He knew the strong and weak points of every individual in his flock and by judicious matings secured success.

Every man can hardly expect to be a judge capable of giving decisions at our great shows or be a Bakewell or Amos Cruikshank, but every breeder, if he expects to accomplish results as an improver of his live stock, must know the conformation consistent with each animal's utility and the type which will yield him the largest returns.

There are two classes of dairymen

—those who keep cows and those whom cows keep. The former receive an average yield of from 3000 to 5000 lbs. of milk. The latter receive an average yield of from 5000 to 10000 lbs. The latter realize a greater net profit from one high producing cow than does the former from his entire herd. The latter selects and tests his breeding stock. It means money to the farmer and breeder to be a capable selector. During the past ten years the number of dairy cows has decreased yet the production has increased. The cows have become more proficient producers. The same can be said of every breed of live stock. They are being improved gradually.

To produce the animal which realizes the highest price on the market or wins the red ribbon, the producer must have the proper ideal. What is being done to establish that ideal? At Guelph and Ottawa every winter thousands are given a chance to study the grand champions. More than a thousand receive instruction every winter at O. A. C. The fall fairs also must not be forgotten as a factor in enabling the breeder to form an ideal and yet there is another method.

There are producers who cannot attend any of these sources from which

to obtain reliable information. Hence through the Farmers' Institute organization, co-operating with the District Representative, the two-day Short Course in Stock Judging places a demonstrator at the farmer's door.

The Course is held in some centre of rural population. All interested are invited to attend. Experienced men are sent as demonstrators. Four or five of the best animals in the district are secured for demonstration purposes in each class of live stock.

The demonstrator gives a brief talk on the importance of class of live stock up for discussion. Takes one of the individuals and points out the conformation required in the ideal animal, and explains why such conformation is desirable. It is the fault of the audience if all points covered are not made clear. It is the duty of the demonstrator to answer questions. After an individual has been gone over, the class of stock is brought in and those present given a chance to examine thoroughly and place the animals. A number of the stock men are then asked for their placings with their reasons and a vote of the audience taken on these placings. The instructor then gives his placing and points out his reasons showing the strong and weak characters of each animal. The audience is thus enabled to see the different characters in all their degrees of perfection and should be able to recognize these characters and assemble them into one animal by selection in breeding and produce an animal as nearly perfect as possible. Aside from the actual value of the judging instruction, the audience, individually, is able to secure some valuable hints by personal contact with the demonstrator. His wider knowl-

edge enables him to give expert advice along the lines of selection, breeding and feeding. The man who asks the most questions derives the most benefit. The more questions asked the more successful the demonstrator considers the course.

The two-day Stock Judging Course can be said to be successful in the majority of cases. The farmer is criticized as being too independent for not attending these Courses, and sometimes unjustly. If it were possible to choose days when every man could find it convenient to attend all could consider the course a success with regard to attendance. In some instances the choice of days is very unfortunate and the attendance small. Whether large or small if the appreciation and interest of those present are demonstrated the course should be considered a success and possibly the greatest benefit is accomplished when the audience is small.

It is probable that so long as new breeders are developed the demand for special training will continue. If no new breeders are introduced some older breeders say, "We are never too old to learn," and we want the Short Course. Before the industry has reached the desired level it might be necessary to reseed for several years, or until the fertility of the mind has been increased to produce profitably.

Possibly the most important factor governing the future of the course is the interest shown by the individual. All depends on the appreciation shown and questions asked by the audience. The most successful breeders and judges are willing to offer their services as demonstrators and the finances are guaranteed—the Government is behind it—if the farmers

show an interest in this effort for their betterment.

The difficulty of procuring suitable stock is in some places becoming acute. Every contributor should be remunerated for any expense. So far as possible the individuals in each class should belong to the same owner and preferably not intended for sale. This dispenses with the different factions or the champions of contending neighbors. Far better results can be accomplished with less

dissatisfaction by making two classes of two animals than one class of four when it is deemed necessary. The selection of animals from indifferent contributors and a conscientious arrangement of classes will assist in overcoming this difficulty.

The Short Course reaches the majority by coming to them. If the farmers and breeders are appreciative this method of distributing knowledge will continue indefinitely.



ANTE MORTEM

By Berton Braley

When it comes my time to die,
 When I take the trail no more,
 Do not bury me where I
 Close and deep and still must lie
 As I've never done before.
 I would not be peaceful there,
 Far beneath the sun and air,
 Weighted by the heavy sod
 Whereupon I once had trod.
 This, my friend, is my desire—
 Give me to the cleansing fire
 Which shall make of me a light
 Heap of ashes, fine and white.

Then—I bid you blithly take
 Just that little left of me,
 Throw it to the winds, and shake
 Every tiny portion free,
 So my ashes may be blown
 By the winds I long have known
 So that I may wander far
 Where my living comrades are,
 Roving in their careless mirth
 Back and forth across the earth.
 "Dust to dust and clay to clay,"
 Saith the preacher droningly;
 —But I want my dust to be
 Dust upon the broad highway!
 Friend, remember this my cry
 When it comes my time to die!

Soil Fertility and Honey Production

BY PROF. H. A. SURFACE.

(Read before the National Beekeepers' Association at St. Louis, Feb., 1914.)

IT is generally agreed that we cannot plant for nectar or honey production alone. In other words, to sow a field to any kind of crop merely for the sake of the honey it might produce is scarcely profitable. If, however, the field crop can be made a successful primary feature, honey production as a secondary feature is entirely clear gain, as most profits come from comparatively small things. We note, for example, that the packing houses of Chicago utilize every part and by-product of the hog, excepting the squeal, and it is now proposed that they utilize that in making phonographic records to aid the old style beekeepers in making more noise to help hive their swarms.

In this day of keen agricultural competition, every factor possible should aid the husbandman. Conditions are against success from continued cropping or from old style methods. It is impossible for any husbandman to succeed without considering all the factors that enter into modern agriculture. He may be up-to-date in many things, but if not in all, he may fail. He may select seed in accordance with the methods of Holden or Hunt; he may fertilize in accordance with the latest directions from Hopkins or Thorne, and may cultivate according to Hilgarde, and spray according to Gillette, Forbes or Howard, but when crop returns are sought he must see "the handwriting on the wall" or hear the saddening statement that was made to the rich young

man who went to Christ: "One thing thou lackest." This is soil fertility with organic matter.

To buy commercial fertilizer and depend upon it, year after year, as a source of plant fertility, will eventually make a rich man poor. We do not have enough barnyard manure to meet the needs of our extensive agriculturists or horticulturists. How then, can a poor man increase the yield by economical means? This is a question of such far-reaching importance as to justify our attention for a few minutes, even though at first it may be beyond anything pertaining to bee-culture.

The greatest element of plant food is "nitrogen." It is also the most expensive element in our commercial fertilizers, and the most difficult to get into the soil by artificial means. At the same time it is the most abundant element in the atmosphere. Practically 11 pounds of this material rests upon each square inch of the earth's surface. Why is it not directly utilized? Because it must be transformed into a compound that can be taken up by the plants. An illustration is seen in the lowly field bean. In its raw state it will scarcely sustain human life, but properly cooked there is no more nourishing article of food for mankind. Thus, when the nitrogen in the atmosphere is transformed, it becomes at once the most stimulating or invigorating element in the food of plants.

How is this transformation effected? Here is the important point. This is done in nature's laboratory by myriads of organisms known as bac-

teria, that live in a mutually beneficial relationship, known as symbiosis, upon the roots of the legume plants, the members of the Pulse or Pea and Bean family, botanically known as Leguminosae. Upon the roots of all members of this family these beneficial bacteria, gathering and transforming nitrogen, live in great numbers, forming little lumps or nodules. Upon practically each kind there is a different species of bacterium. So the nodules taken from the roots of different kinds of legume plants differ in size, shape, color, and general appearance. These nodules or lumps are large enough to be seen readily by the unaided eye.

Take up, for example, the roots of the common white clover, white sweet clover, red clover, crimson clover, alfalfa, the locust tree, and the red-bud tree, keeping the surrounding earth with them until they are placed in water, and very gently washed to avoid breaking their minute fibers. Note the small white, pinkish or brownish lumps that are there. These are the nodules, the homes of myriads of bacteria, which are plainly seen when a lump is crushed under a compound microscope of high power. They are composed almost entirely of available nitrogen transformed from the unavailable nitrogen of the atmosphere by the vital action of these microscopical organisms, and thus rendered fit for immediate use by the plants upon which they grow, as well as by other plants grown in the same soil. Therefore, it can be seen that the more such legume plants are grown in any soil, the more fertile the soil becomes from the increase of nitrogen and organic material.

As the plants mature they draw upon the nitrogen stored in the nodules

on their rootlets, using part of it in formation of tissue, especially seeds.

A bulletin, No. 145, from the Agricultural Experiment Station at Brookings, S. Dak., says: "Every ton of clover hay takes 40 pounds of nitrogen from the air, and every ton of alfalfa takes 50 pounds from the air, through the roots of these plants." Hence, by growing these crops, or other legume crops, and returning them to the soil, either directly or after they have been transformed into manure, a supply of nitrogen may be maintained in the soil.

So much for the primary story of increasing soil fertility, which is really more important than increasing the size of the farm. A secondary point for consideration is, for us beekeepers, of no small importance. Among the very best honey-producing plants in the world are the legumes. With crimson clover and locust blossoms in the spring, we have a close succession of alsike, white clover, yellow sweet clover, alfalfa, and white sweet clover, upon all of which the honey bees work to a remarkable extent. Every one of these legumes is of great benefit as a soil renewer, and they are recognized as being the chief honey-producing plants of America, with but few exceptions.

Another important point is that these are our greatest forage plants. No other plants contain as much protein or are as beneficial for live stock. The energy of the work horse and the yield of milk from dairy cattle increase when these plants are used either as pasture or hay. The growth of pork is greater when they supplement the grain feeds. The production of eggs is increased by their proper use in the poultry yard, and there is a report of a banquet of

western growers, in which one of these plants—alfalfa—furnished not only bread and vegetable food, but also a food used as breakfast cereal.

To get the benefits of such plant growth for the beekeeper it is necessary that the bees have opportunity to visit their blossoms. This means that they should grow at least until the blossoms are commencing to fade or wither. The heaviest nectar secretion is just at the time of the opening of the bloom. After a flower has been visited by a bee and fertilized, the secretion of nectar stops and the blossom fades and drops.

Here, again, good agricultural practice is in accordance with apiculture profits. It so happens that the best results for hay or stock food are obtained by cutting just before the seeds form, which is just after the blossoms have passed their stage of perfection and are withering. Also when these crops are to be turned down for soiling crops, the best results are obtained by plowing them down when they reach this same stage of development. To plow down a great crop before blooming means to put into the ground too much water in the form of thin sap, and there is special danger of souring the soil then. The juice in a plant commences to become thick after it has passed the vital period of full bloom. It is also the time when it has done its greatest work in transforming and fixing nitrogen. But the fertility is not lost by using the plant as stock food. If the manures, liquid and solid, are saved and returned to the field, it will have as great fertilizing value as though it had been plowed down, and the grower will have the increased benefit of its feeding value for his live stock.

From the further standpoint of the greatest fertility from the nitrogenous nodules, it must be remembered that their best stage of perfection is reached also when the plant is at its highest point of development, or just at the end of blooming and the beginning of the ripening of the seed. Thus whether the plants be plowed down, or cut for silo, or dried for hay, the best results for honey production, for soil fertility and for animal food are obtained by letting them reach a fair stage of development, rather than cutting, as is the fault of so many husbandmen before the blossoms open.

It, therefore, becomes important for every one interested in tilling the soil, to plant legume crops at every opportunity. They can be used as filler crops at the time of year when nothing else is grown, as, for example, by sowing crimson clover just before the last time the cultivator is run through the corn field. Last year the writer sowed 3 quarts of crimson clover and $\frac{1}{2}$ pint of cowhorn turnip seed to the acre in a corn field. After the corn was harvested he removed tons of the best turnips for cow food and table use, and, at the present time, has a good clover sod on what would otherwise be barren and stubble. The time has come when it must be regarded as slothful for a man to leave his soil without a clover crop as to leave his implements exposed in the field during the winter. From this crimson clover sod next May will spring a wealth of scarlet bloom, looking like a field covered with ripening strawberries and humming with bees as in the swarming season.

Legumes are averse to acid soils. The soil wherein they are to grow should be sweetened by the use of at

least one ton of lime, or one or two tons of finely ground limestone, per acre, before seeding. In the case of corn, this can be done by spreading the lime broadcast just before planting in the spring.

Soil inoculation is another important point in order to be sure of an abundant growth of soil bacteria and nitrifying nodules, and consequently legume growth. This can be effected best by sowing broadcast two or three hundred pounds per acre of soil taken from a field which has previously grown the legume crop that is to be planted. Another means of inoculation is to sow the crop and let it reach fair maturity, or even go to seed again on the same soil. Then turn it down and seed again. After two or three repeated efforts on soil where lime has been used, there will be an inoculation and a good growth in the future.

A third means of inoculation is through cultures prepared by different commercial concerns and sent by mail. This is the most expensive and least satisfactory means of inoculation. As a rule, we do not recommend it. The best is by sowing soil from the field that has grown the crop desired. Apply it in the evening or on a cloudy day, just before sowing seed, and harrow in both soil and seed.

While, as a rule, each legume has its own kind of bacterium, there are exceptions, as, for example, in growing white sweet clover to produce the

inoculation for alfalfa. In this case the bacterium is the same.

Legumes have their own proper or best respective seasons for seeding. We sow red clover and alsike in our grain fields in February, when the ground is honey-combed with frost. Just as early as the soil can be worked in the spring we sow Canada field peas, with or without oats. A few years ago, in our own fields, we drilled Canada field peas, oats, red clover and alsike, and had a good stand of the three legumes, so that, as the peas and oats were cut, the clover field remained. Later in the spring, just after corn planting, is the proper time for cow peas, soy beans, field beans or soup beans.

Midsummer is the best time for sowing crimson clover, and the early part of August for seeding with alfalfa. Later in August, or early in September, we sow hairy or winter vetch, with or without rye, but prefer one peck of vetch and two or three pecks of rye to the acre, to give one of the best crops that can be used for a winter cover crop, renewing soil fertility and also keeping the bees busily and profitably engaged.

In conclusion, let me say that the man who knows how to use legumes in each crop rotation, and keeps the legumes always on his ground as a cover crop, will have honey in his hives and money in the bank.

Harrisburg, Pa.

QUERIES

Dear Sir,—I am now taking privilege to ask you information regarding the said "Cucumber Blight." The one in question is not the regular red leaf blight, not so, but instead the plant looks healthy say to-night, and on the following morning one would think it had been frozen. It first wilts then turns white in about 24 hours. If you have any information to give as to the cause or cure of this blight, I would be very glad to hear it and follow out your advice. I grow about 5 acres per year. Last year this peculiar blight took about half of them just as they started to bear.

Hoping you have some advice to give, I remain,

Yours truly,

WORRIED.

Dear Sir,—After reading your letter regarding the trouble with your cucumbers, we conclude that in all probability what they were suffering from was the disease known as the Bacterial Wilt of Cucurbits. This disease is liable to attack cucumbers, melons, squashes and all other species of cucurbits. When once it gets into one of these plants it nearly always means death to the plant in one or two days. It is carried from plant to plant by insects, particularly the cucumber beetle and squash bug which, after feeding on a diseased plant and thus getting contaminated with the germ of the disease, carry it to whatever other cucurbit plants they go to next. It has been known to travel in this way from one end of a large

cucumber house to the other and kill every plant there within a week. As the name indicates, the disease is of a bacterial nature. The bacillus which causes it, *Bacillus tracheiphilus*, on getting into the plant through an insect bite or wound caused in any other way during cultivation, etc., rapidly multiplies in the vascular bundles, that is in the veins of the leaves and stems and chokes them up causing the plant to wilt as you described yours wilting.

As soon as a plant is observed to be suffering from this disease it should be carefully removed from the bed and burned to prevent the disease from spreading to other plants. No treatment will cure an affected plant, but by totally destroying by fire what plants are diseased, other plants will be saved.

If at any time you should be troubled again with the disease you would send us one or two of the plants, carefully packed, we should be pleased to make an examination of them and report to you the results.

D. H. J.

Query Editor:—

I have a small black currant plantation that does not seem to be doing well. While engaged in pruning it out this spring I noticed that many of the canes were hollow, and in some places this hollow was filled with dark brown castings. I examined a few canes and found in them a small white larvae with a brown head. Will you please

tell me what the pest is and the means of control.

Yours etc.,

J. T.

The white larva with a brown head, which you found in your currant canes when pruning is the larva of the Currant Cane-borer. The adult is a clear-winged moth looking somewhat like a medium-sized wasp. The moths appear in June and lay their eggs in the axils of the leaves. The larvae on hatching bore into the pith of the cane and feed there the rest of the season. In spring they change to pupae in these tunnels.

The only means of control that has been discovered is to practice a method of pruning in spring in which the older canes are removed each year and younger ones allowed to take

their places. As much the greater number of larvae are found in these older canes it is clear that by removing and burning them in spring much will be done to lessen the number of the pest. Of course, if any cane whether young or old is in pruning seen to be infested it should be cut below where the larva is and burned.

INTENSIVE CULTURE.

The mayor of a town in Normandy has been decorated by the French Government for being the father of twenty sons. The Order is that of "Agricultural Merit!"

Such an Order in this country might be the means of solving the rural depopulation problem! It might interest the O. A. C. Review readers.



A HOPELESS PROPOSITION

If you have a sow which is the mother of a large and growing family and is so neglectful of their interests that every once in a while she will lie down on one of her offspring and cause it to turn black in the face, it will do no good to kick her in the short ribs. By holding a lump of sugar before her nose she will rise to her feet without touching her knees and allow the pig to get its breath back without calling in a pulmotor. The female sow which makes it a practice of sleeping at full length on her children is about as hopeless a proposition as a hair-lipped girl playing post office.

Examination Results

Medals, Scholarships, and Prizes Awarded April, 1914

Governor-General's Silver Medal (General Proficiency, First and Second Year Work.) L. P. Clemens, Galt, Ont.	5—Elder	1889
The George Chapman Scholarship— (\$20 in books.) L. P. Clemens, Galt, Ont.	6—Miller	1846
Valedictory Prizeman— (\$10 in books.) W. Bennett, 53 Crescent St. Peterborough, Ont.	7—Lane	1834
First in General Proficiency, First and Second Year Work— L. P. Clemens, Galt, Ont.	8—Gregory	1819
First-Class Honors, Major Subjects, Fourth Year— C. W. Stanley, Granton, Ont.	9—McKillican	1801
Scholarships of \$20 each awarded on First Year Work, Theory and Practice— Group I.—A. H. Cowan, Napanee, Ont.	10—Brownlee	1781
Group II.—E. G. Rowley, Aldershot, Ont.	11—Harris	1759
Group III.—J. C. Neale, Lambeth, Ont.	12—Martin	1758
Group IV.—R. C. Elder, Canfield, Ont.	13—Slack	1737
Canada Industrial Scholarships— First—\$50, B. H. Blanchard, Baddeck, Ont.	14—Percival	1736
Second — \$30, S. H. Hopkins, Guelph, Ont.	15—Bradley	1732
Third—\$20, R. L. Vining, Thornedale, Ont.	16—Scott	1728
Results of First Year Examinations (arranged in order of Proficiency.) YEAR STANDING, April, 1914 Maximum 2,500.	17—Gautby, C.	1726
1—Rowley	18—Cox	1728
2—Cowan	19—Bissett	1715
3—Neale, J.	20—Hamilton	1712
4—Stokes	21—Quail	1710
	22—Mason	1707
	23—Fuller	1705
	24—Pereira	1694
	25—Fisher	1693
	26—Hammond	1691
	27—Cudmore	1677
	28—Evans	1660
	29—Camp	1650
	30—Neilson	1646
	31—Shearer	1643
	32—Selwyn	1640
	33—Hempson	1607
	34—McMullin	1607
	35—Graham, C.	1606
	36—Davey	1591
	37—Agar, E.	1590
	38—Webber	1587
	39—Timms	1584
	40—Hockey	1558
	41—Gautby, L.	1557
	41—Woodgate	1557
	43—Murdoch	1545
	45—Meek	1542
	46—Wilson J R	1541
	47—Runnalls	1539
	48—Fulton	1531
	48—Knox	1531

50—Wood	1524	98—Fenwick	1355
51—Lee	1516	99—McCook	1354
51—Mallory	1516	100—Rawson	1352
53—Waterman	1512	101—Skinner	1338
54—Neal, C. W.	1510	102—Western	1335
55—Steckley	1508	103—Parsons	1334
56—Smith, G. L.	1507	104—Merkley	1331
57—Hunter	1503	105—Morris	1319
58—Frost	1501	106—McLoughry	1311
59—Saxton	1497	107—Newman	1304
60—Schwemann	1494	107—Nixon	1304
61—Hill	1491	109—Mills	1302
62—Foley	1488	110—Lannin	1300
63—Simmons	1483	111—Brubacher	1295
64—Bonham	1475	112—Fallis	1293
65—Hogarth	1474	112—Houghton	1293
66—Allan	1472	114—Stickle	1281
67—Thompson, I. B.	1469	115—Morton	1277
68—Hanlan	1466	116—Arnold	1271
69—Bagsley	1458	117—Braund	1270
69—Powys	1458	118—Waterfall	1262
71—Keillor	1451	119—Munro	1252
72—Delahay	1447	120—Lovekin	1248
73—Bethune	1438	122—Currie	1246
74—Lawrence	1436	123—McConnell	1244
75—Malcolm	1433	125—Goldie	1235
76—Luckham	1430	126—Sims	1234
76—McPhail	1430	127—Rowlands	1233
78—Forman	1429	128—Jemmett	1232
78—Gilholm	1429	128—Orlowski	1232
80—Springstead	1420	130—Holmden	1227
81—Keirstead	1417	131—Cleland	1222
82—Kelly	1415	132—Linn	1221
83—McNiven	1414	133—Grierson	1219
84—Ure	1409	134—Anderson	1216
85—Davis	1405	135—Dempsey	1214
86—Campbell	1403	136—Waters	1212
87—Chilcott	1398	137—Chamberlain	1205
88—Caldwell	1395	138—Clarry	1201
89—Nelson	1394	139—McCurry	1197
90—Raiton	1387	140—Thomson, R. F.	1180
91—Thomson, J. C.	1375	141—Patrick	1174
92—Fleming	1373	142—Westra	1170
92—Patton	1373	143—McNeil	1168
94—Boulton	1370	144—Sirett	1167
95—Henry	1361	145—Roger	1147
96—Singleton	1357	147—Mann	1119
97—Stoddart	1356	148—McArthur	1116

149—Agar, C.	1107	26—Flancher	2099
149—Landon	1107	27—Walsh	2084
151—Edwards, G.	1103	28—Curran	2082
152—Moore	1101	28—Stothers	2082
153—Fitzpatrick	1097	30—Elliott, D.	2062
154—Case	1088	31—Beaumont	2053
156—Franklin	1082	32—Morse	2052
157—Simonds	1076	33—Steele	2048
158—Wilson, A.	1068	34—McLarty	2047
159—Foulds	1059	35—Small	2042
160—Parker	1055	36—Bird	2041
161—Edwards, H.	1036	37—McClymont	2018
162—Hawley	1028	38—Knoop	2010
164—Pulleine	971	39—Carroll	2000

Students whose names do not appear in above list failed in three or more subjects and are not eligible for Second Year.

Results of Second Year Examinations (Arranged in order of Proficiency)

YEAR STANDING, April, 1914

Maximum 3,200.

1—Clemens	2547	48—Neff	1967
2—Cotsworth	2486	50—Donaldson	1963
3—Huckett	2423	50—Elgie	1963
4—Garlick	2420	52—Atkins	1961
5—Lord, L.	2409	53—Manton	1950
6—Foot	2376	54—Hunter	1946
7—White	2350	55—Lee	1936
8—Ferguson	2344	55—McDermott	1936
9—Jenses	2341	57—Knapp	1918
10—Thompson	2307	58—Booker	1916
11—Brown	2306	58—Glavin	1916
12—Culp	2291	*60—Wheatley	1913
13—Bennett	2269	61—Walker	1902
14—Schuyler	2254	62—Reilly	1898
15—Carnecross	2235	63—Aiton	1893
16—Waterman	2231	64—Scott	1892
17—Austin	2208	65—Welton	1874
18—Yule	2204	*66—Harding	1869
19—Townsend	2170	*67—Mainse	1868
19—Weston	2170	68—Murray	1862
21—Van Every	2161	*69—Altenburg	1859
22—Jones	2156	70—Reeker	1854
23—Foreman	2144	71—Abreham	1840
24—Skelton	2103	72—Puleston	1839
25—Fitzgerald	2101	73—Stewart	1833

74—Langley	1829	15—Foyston	1436
75—Maxwell	1827	16—Colquette	1433
76—Adair	1825	17—Croskery	1424
*76—Gregg	1825	18—Laird	1414
*78—Hill	1812	19—Fiinn	1379
79—Seitz	1809	20—Gray	1373
*80—Bryden	1804	21—Peren	1357
*81—Sandy	1800	22—Hampson	1350
82—Walther	1796	23—Shipton	1347
83—Oldfield	1792	24—Horobin	1328
84—Zavitz	1768	25—Hinnan	1304
*85—Hartley	1738	26—Mucklow	1296
*86—Light	1737	27—Frejd	1291
87—Lord, S. N.	1720	28—Hodgins	1287
88—Halpenny	1711	29—Bertram	1269
*89—Griffin	1710	30—Sackville	1259
89—Lackner	1710	31—Goodman	1255
*91—Edye	1696	32—Ponton	1243
*92—Baker	1691	33—Overholt	1241
93—Dougherty	1678	34—Neilson	1239
*94—Wilson	1656	35—Kerr	1237
*95—Rowland	1646	36—White	1231
*96—Sproule	1630	37—Pawley	1221
*97—Sibbet	1625	38—Steckle	1216
*98—Gandier	1614	39—Hart	1207
*99—Mitchell	1614	40—Robb	1205
‡100—Currey	1580	41—Braithwaite	1198
‡103—McCormick	1511	42—Amos	1191
*Less than 60 per cent. in English, therefore not eligible for Third Year.			
‡Less than 50 per cent. general proficiency.			
Results of Third Year Examinations, (Arranged in Order of Proficiency)			
YEAR STANDING, April, 1914			
1—McLaren	1871	47—Tawse	1157
2—Archibald	1772	48—Townasley	1155
3—Cory	1665	49—Locke	1152
4—Crawford	1657	50—Hall	1128
5—McQueen	1614	51—Cumming	1118
6—Bell	1590	52—Burrows, L. F.	1111
7—Holmes	1530	53—Rumsby	1095
8—Magee	1528	54—Beatty	1089
9—Smith	1497	55—Gardiner	1078
10—Scott	1494	58—Gordon	1071
11—Donaldson	1485	59—McCall	1013
12—Bligh	1478	60—Johnston	996
13—McCharles	1470	61—Stratford	983
14—Dustan	1452	62—Francis	982
Students, whose names do not ap- pear in above list, failed to make Fourth Year standing.			



ALUMNI

Mr. J. W. Hart.

The class mates of Mr. J. W. Hart will regret to learn of his death which occurred in a most tragic manner at Jekyl Island, Georgia, May 29th. Up to a few weeks previous to his death, Mr. Hart had been engaged by the State College of Agriculture, University of Georgia. At that time, he resigned to accept the position of Assistant Manager of the Jekyl Island Club.

It appears that a fisherman named Thompson had been restricted by Mr. Hart in the privilege of gathering turtle eggs on the beach of the island, and meeting Mr. Hart at night on the beach shot and killed him.

Mr. Hart received his associate diploma at this College in 1887. Upon leaving the College he went to South Carolina spending five years at Clemson where he established a Department of Animal Husbandry. Later he spent some years at the University of Illinois and then went to Brazil where he was head of the first Agricultural College of that country. He went from Brazil to Puerto Rico, returning to the University of Georgia about three years ago. At the time of his death Mr. Hart was just at his prime being 45 years of age.

Dean Carlyle

Dean Carlyle graduated from the Ontario Agricultural College in 1892, securing from the University of Toronto the B.S.A. degree. He now holds an M.S. degree, having secured

it in 1905 from the Colorado Agricultural College. He started work in his home institution in 1893, and has been actively engaged ever since in agricultural work; and, practically all of that time in college and experiment station work. After spending one year with the Ontario College he was secured by Prof. Thomas Shaw, then Professor of Agriculture, at the University of Minnesota, as field lecturer in live stock and dairy husbandry. He continued at this work for four years and made a wide circle of acquaintances throughout the State of Minnesota, and thus was one of the pioneers in Extension work. Some of his work in dairying was the taking of samples of cream just as they were brought in by the farmers and churning them into good butter on the stage in front of the audience. In 1897 he went to the University of Wisconsin as Professor of Animal Husbandry. His particular work there consisted in the breeding of horses and sheep and feeding work in milk production. He also had a great deal to do with building up the Short Course of Wisconsin, which is the pioneer state in that kind of work, and he was a prominent factor in bringing the live stock men of Wisconsin into close touch and appreciation of the animal husbandry work of the University. In 1903 Professor Carlyle was called to the Colorado Agricultural College as Professor of Agriculture, and in 1905 at the same institution was made Dean of Agriculture continuing in that position till

1909. In 1905 the Carriage Horse breeding work carried on in co-operation by the College and the United States Department of Agriculture was started at Fort Collins, and Dean Carlyle was made expert in Animal Husbandry in charge. He is largely responsible for the selection of the foundation stock and for putting that experiment on a stable basis. His work at the Colorado Station consisted largely in building up the Agricultural Department of the Institution, which up to that time had been considered something of a joke. He also brought the college from an agricultural point of view closely in touch with the farming interests of the state. In the winter of 1909 Dean Carlyle was connected with the A. J. Knollin Company of Chicago, spending most of his time in planning to develop the large land holdings of that Company in South Idaho. During the summer of 1909 the Dean was superintendent in charge of the Live Stock Division of the Alaska-Yukon Pacific Exposition. In 1910 he was chosen Dean of the College of Agriculture and Director of the Experiment Station of the University of Idaho, and has served in that capacity since that time, acting in the interval, February 1, 1913, to April 1, 1914, as President of the University. In Idaho he has put the College of Agriculture on a firm and stable foundation, giving it front rank among the agricultural colleges of the West. He is responsible for the organization and development of the extension work in the state, the experimental and demonstration farms and the upbuilding of the teaching and experimental work as now conducted at Moscow.

In addition to the above, Dean Car-

lyle has had as wide experience probably as any man in America in judging at live stock shows, having judged at the principle shows of America, particularly in the horse department, and having served as official judge in one or more departments eleven years in succession at the "International" at Chicago. He was married to Miss Inez Fairbanks, of the State of New York, and has two daughters.

Mr. G. E. Smith

Mr. G. E. Smith, who was for some years on the staff of the chemical department, was married to Miss Norma Fenton, an old "Mac" girl, on April 29, at the Bride's parents' residence, 31 Emerald street, Hamilton.

This winter Mr. Smith has been taking post graduate work at Toronto University. He now takes his bride west to resume his position on the chemical department of Montana University.

C. A. Mayberry

C. A. Mayberry and his wife were welcome visitors at the College June 22nd. After trying various positions of the salaried kind and satisfying all for whom he worked that his abilities were of a high order, he suddenly came to himself, and returned to the home farm where he is successfully carrying on a dairy business. He is always watching out for a labor saving invention. His herd of fifty cows is milked in about as many minutes by a milking machine run by a gasoline engine. He buys the best stock and the best feed and lives right up to his scientific training and reputation.

The class of '05 will please take notice that Mayberry is keen on a class reunion in the fall of 1915. In the meantime we wish him and his family abundance of success.

A Case of Reversion

By GEORGE SHEPHERD

JULY, 1873, on the edge of the Khivan Oasis. Looking back to the east, one's eyes rest on the pleasant vista of the rich gardens of the Oxus, a comfortable prospect of fertile, well stocked farm lands. Wheat fields, melon patches, peach orchards and vineyards blend into a landscape which proves how easily plenty and prosperity are won on the banks of the Oxus. Of human habitation one sees only here and there a few low, mud-walled, thatch-roofed huts, the occasional dwellings of a people whom no richness of soil can wean from the habits of a thousand years of nomad life.

Stretching out to the west is space, vast and limitless; an unbounded, untracked expanse of softly undulating desert that reaches away to the heat-quivering horizon, and from that horizon to the next, and so on through countless more to the distant Caspian Sea.

For fifty generations this empty, masterless land has been the home of the wild, masterless clans of Yomud Turkomans. They have roamed over it from one distant well to the next, carrying with them their families and household goods and gods, unrestrained, unrepressed, owing allegiance to no man and obeying no laws but their own tribal customs.

They are wild, ruthless and cruel; but not treacherous. Love and loyalty they know, for each tribe honors and is true to its own women, children, elders and horses. Nor, indeed, should the horses come last. The Turkoman has the same pride in and affection for the wonderful clean-

limbed animal which carries him over the unmeasured desert as he has for his own offspring.

But to-day there runs back through the farm lands a league-wide strip of blackened, smoldering devastation, left behind by the eight companies of Russian infantry and the eight sotnias of Cossacks that are drawn up on the edge of the desert. In front of them swarm a cloud of Turkoman horsemen who gallop back and forth across the plain, firing their flintlocks, yelling and sometimes riding forward and taunting the invaders to single combat. But the most dashing Cossack would have a sorry chance on his worn-out mount against one of these desert riders on his matchless horse; so the officers hold the men in the ranks.

Disappearing into the desert beyond, the Turkoman horsemen can be seen, an indistinguishable mass of old men, women, children, horses, camels, sheep, goats and cattle, all rushing off in wild, frightened confusion.

Presently a few hundred of the Turkomans gather into something like a coherent mass in front of one Russian flank. A white-uniformed officer rides out in front of a sotnia.

"Gotova! (Charge!)" he shouts, and the sotnia gallops forward boot to boot in the irresistible, ordered charge of disciplined calvary. They ride a quarter of a mile and, in a cloud of dust, they reach the spot where the mass had been; but there is no shock of horse against horse, nor ring of saber on saber. There, a hundred yards away, are the Turkomans, their horses cantering lightly

off with easy, springy bounds, while the riders jeer and taunt their slow-moving enemy. One might as well use a sledge hammer to annihilate wind-blown feathers.

The whole Russian line begins to move slowly and steadily forward, while the horsemen dash yet more wildly to and fro in front of it, always receding, but still giving ground slowly enough to cover the retreat of the fleeing mass of their non-combatants. Finally the Russians reach a broad, dry canal with steep banks.

Here they come on a dozen abandoned arbas, or carts. They are full of carpets, cushions, cooking-utensils, threshed wheat, spun silk and clothing. Some of the men stop to loot. Sitting on a heap of rugs in one of the carts they find a six-year-old child, looking with curious eyes on the strange scene. In his face is not a sign of fear, and as a flapping banner goes by he crows and laughs.

"He is offering his allegiance to the Czar, nothing less," calls out a lieutenant of infantry. "Ho, there, sergeant! Take the child and see that he is fed and cared for. If we never catch those devils there, we will make at least one Russian subject on this campaign. And catch them we never will as long as they have their horses."

So little Ak-Umar became a Russian and was renamed Ivan. He was taken to Riga. There he grew up and married, had a child and died. All his life he was nothing but a dock laborer, an unthinking, sluggish beast of burden. But his child—

Chapter II.

To young Ivan Ivanoff, like his father a dock laborer in Riga, there came one day a man who was recruit-

ing laborers for the sugar plantations of Hawaii. Ivanoff was twenty years old, strong, healthy and, one would have judged, inexpressibly stupid. The hours of his life which had not been passed in back-breaking toil had been spent in crowded tenements. Never had he been alone.

Think what that means. Imagine, if you can, what it would mean never to have a minute, sleeping or waking, when you were not in contact with—in the almost literal sense of the word—other people, and people who were not at all of your choosing. Yet that is the way Ivanoff lived. And there are plenty more like him.

The sorriest broken-down dray horse has had more of pleasure in his life than had Ivanoff when he had rounded out his first score of years; for horses are foaled in the country, and pass their colt-hood in green fields where they have room to kick up their heels and frolic when they like.

The labor agent said to Ivanoff:

"Will you go on a big steamer to a country farther away than America? There you will find easy work, good wages, and plenty to eat. The company will pay your way, provide a doctor for you when you are ill, and give you a suit of clothes."

Ivanoff appeared to consider for a moment. The idea of bettering himself made little appeal to him, for what measure had he by which to reckon the hardness of his lot? But still something—perhaps the fifty generations of nomads back of him—made him say:

"Yes, I'll go. When does the steamer leave?"

When the emigrant steamer reached Honolulu the laborers were put in a well ordered, very sanitary and

overcrowded camp to be kept until they could be distributed among the various plantations. By virtue of well meaning contract-labor laws, theoretically they were free agents; so before they could be drafted to an estate each man had to go through the form of giving his consent. One morning the agent of the Alaskan Plantation was picking up the number of men who had been allotted to him, and coming to Ivanoff he said to him through an interpreter:

"I will give you eighteen dollars a month and your quarters to come and work in the fields on my plantation. It's a sort of a big farm, you know," he explained.

"A farm—fields," replied Ivanoff with a perplexed look on his dull face. "What are they?"

The interpreter laughed, and so did the agent when he heard Ivanoff's words.

"Come along," he said. "We can't use any gutter sweepings. Queer-looking fellow, though. He doesn't look much like the rest of these Russians."

So instead of going to a plantation Ivanoff went to work in an iron foundry in the City of Honolulu. Not yet was he to learn that there exist in the world stretches of land that are not crowded by man.

The slums of a small city are often just as densely packed, just as foul and just as deadly in stifling the growth of vigorous manhood as those of the greatest metropolis. Ivanoff's life was no better than it had been in Riga, and his soul was no less thickly overlaid with the noxious crust that grows in the tainted air where are huddled the scum and the dregs of humanity.

His work was hard and his hours

were long. To this he was accustomed, but now there came a new oppression. Ivan, of course, understood no word of English, and by foremen, superintendents and other petty tyrants his failure to understand orders was often mistaken for unwillingness to obey, or for laziness, insubordination, or general perverseness. So the poor boy was bullied and browbeaten, and, worst of all, laughed at.

He had been used to authority—had accepted it as inevitable and natural; but this new manner of it, this domineering, uncomprehending arrogance, slowly began to fester in his unawakened soul. In his dull, stupid way he became vastly resentful, though he scarcely had the wit to realize it himself.

"Put that barrel of cement on a truck and take it over there. Sharp now!" said a foreman to him one day.

Ivanoff shook his head to show he did not understand and tried to ask the foreman what he meant, gesticulating violently to make his words more clear. The foreman misunderstood the halting words and was frightened by the waving hands.

"I'll teach you to make a move like that at me!" he shouted, and felled Ivanoff with a spanner.

The affair was seen by one Serovatsky, a ferret-faced, half Americanized little Russian who was an assistant timekeeper in the foundry. That evening when the whistle blew, Serovatsky met Ivanoff at the gate and walked home with him. The little man was very sympathetic.

"It is the brutality of the tyrant you have had visited on you," he said.

"Yes," admitted Ivanoff, feeling his head.

"But after all," went on Serovatsky, "it is but a piece of the whole

vicious system; but a single efflorescence of the whole organized politico-capitalistic conspiracy that exists for the purpose of oppressing the masses. A conspiracy that owes its power only to the fact that the men who are the real producers and the sources of its wealth—men like you and me, Ivanoff—are supinely willing to obey its orders."

"I would have obeyed him," said Ivanoff, "only I did not understand him. He should not have struck me."

Serovatsky restrained an exclamation of impatience.

That night in his room he carefully hunted through a pile of pamphlets and leaflets, badly printed and on cheap paper, until he found one in Russian entitled, "Convincing Arguments to Be Addressed to Those of Limited Intelligence." This he read with deep absorption.

The next day when work was over Serovatsky treated Ivanoff to a glass of beer at the sordid little saloon across the street from the foundry. Then he suggested taking a walk. Ivanoff was tired and said so.

"Nevertheless, you had better come. There are things of importance I would show you," said Serovatsky.

Ivanoff, thinking that perhaps it might mean another glass of beer, consented.

Serovatsky led the way out of the district of squalid, tumble-down houses packed with Japanese, Chinese, Russians, Portuguese, Hawaiians and the mixtures of all of them, through a street of cheap shops and finally out to a region where the streets were broad and well tended and the houses large and far apart.

Presently he stopped before a big stone house with deep, cool-looking

verandas and yellow-striped awnings over the windows. It was set back beyond a wide expanse of smooth green lawn which was broken here and there with rare and beautiful tropical plants and flowering shrubs. A driveway lined with scarlet-flecked hibiscus bushes led from the street to the house and then back to the stable and garage in the rear. From a group of people somewhere on a veranda came the sound of voices, laughing and light-hearted; the voices of people to whom food and shelter come as a matter of course.

"Look," said Serovatsky, as they stopped in front of the house. "Look well."

"Yes," said Ivanoff, "I see. It is a palace."

"The man who lives there," went on Serovatsky, "never works. Yet he has all of everything he wants. Always there is enough to eat. Vodka he has as much as he likes. He has but to hold up his finger, and that which he desires is brought to him.

"If at night he drinks too much, in the morning there are servants to bathe his head with ice. Clothes of the finest linen and silk he has in such numbers that never need he wear a garment twice. He never works. He has never known what it is to be tired and hungry as have you and I, Ivanoff. Yet he never works."

"Yes," said Ivanoff.

"And to whom do you think all these things he enjoys belong?"

Ivanoff shook his head stupidly. Such a question seemed quite senseless.

"To you and to me and to all the others whose life-blood he drains," said Serovatsky. "The man who lives there is the owner of our foundry—the foundry where we work and he

does not. What right has he to all of that luxury, to all the food and drink and clothes which we earn for him?"

"But you said that he was the master," said Ivanoff.

Serovatsky stamped angrily.

"But can't you see that he does not work? He has no right to be master and enjoy the fruits of our work."

"I don't understand," said Ivanoff. "He is the master, is he not?"

Serovatsky changed his tactics.

"Do you realize," he asked, "that if it weren't for that man and others like him we would be free? We would work less and eat more. We would live in houses like that and do as he does. We who work would reap the benefits, instead of their going to him who has no right to them. Think what it would be to live as he does."

Chapter III.

Ivanoff gazed stupidly at the house, but his mind could not rise to such dizzy heights. As he looked a groom led a horse up from the stable. A beautiful, clean-limbed thoroughbred it was, with its breeding showing in every line from its alert, cocked-forward ears to its trim hoofs which it put down as daintily as if it were a pretty girl in a ballroom.

A young man in riding-clothes came out the front door and, as the groom held a stirrup, he swung on the horse's back. The groom jumped away and the horse bounded forward, sending the gravel flying from under its feet. Then it steadied down to a springy canter, its slender legs moving swiftly and gracefully under its clean barrel and arched neck.

As horse and rider passed a short ten feet away from him, the dull stupidity vanished from Ivanoff's face,

and in its place came a gleam of something else. Though he did not know it, his ancestors had ridden horses like that for a thousand years.

"Even like that you would be," said Serovatsky as the horse and rider disappeared down the street.

"I do not understand clearly," said Ivanoff. "Explain to me how it would come to pass."

Serovatsky, though crack-brained, was tremendously in earnest, and his system of social philosophy was a fetish on which he lavished all the enthusiastic worship which his warped soul could compass. He was almost a fanatic—but not quite. He still retained a thoroughly normal respect for his own skin and a desire to keep it intact. But otherwise he was willing to go to any length to advance the Cause.

And now, through the medium of the clumsy-witted Ivanoff, he felt that he might be able to fulfil a long-cherished dream and yet live to continue his warfare on the "tyrants." There lacked only the conversion of Ivanoff.

The little man was clever in a petty sort of way, and he put his heart in the task; so in two weeks he had Ivanoff's slow-moving brain pretty thoroughly stirred up. By sticking to the concrete and hammering away Serovatsky had begun to make him feel that he was indeed a downtrodden victim.

Strangely enough, the idea that the new era would bring him food and drink and luxuries of all kinds in heaping measure had little persuasive effect with Ivanoff. But that he would be free to do as he liked, that he would be his own master and live unrestrained, unrepressed, owing allegiance to no man and obeying no law;

it was this half understood thought which awakened strange thrills in him. And it was this that enabled Serovatsky to bring him almost to the frame of mind where he could use him.

Serovatsky had to hasten, for the need was pressing. So one Sunday he got Ivanoff half drunk and took the last step. In the back room of a foul-smelling, filthy little saloon, Serovatsky, quite sober, said to Ivanoff, half fuddled:

"The time of this tyranny is coming to an end. Freedom approaches. Every day it is brought closer by the labors of a band of devoted heroes. Will you join that band, Ivanoff?"

"And what do they do?" asked Ivanoff.

"They make away with the chief tyrants and thus terrify the others until they grant our demands."

"Make away with them—how?"

"By killing them."

"In fighting?"

"Yes—in a way." And Serovatsky explained the anarchistic theory of bombs and assassinations.

"But that is murder," said the stupid Ivanoff.

"It is justice," asserted Serovatsky. "And each tyrant struck down is a heroic blow for the liberation of the slaves. Even here in this country there are such blows to be struck. Listen.

"Next week there comes one who is the Minister of War. It is he who is lord and master of these thousands of soldiers who are kept on the island only to hold us in subjection and permit the tyrants to rob us. A blow at him, and the world will travel many leagues on the road to liberty. To some one will be given the chance to

strike it. Would you like to be the one, Ivanoff?"

"I would fight him," said Ivanoff; "but not murder him. And how can I fight him when he will be surrounded by soldiers?"

Serovatsky argued no more, I said before he was clever. He was also patient, and soon his patience was rewarded.

Chapter IV.

Three days later Barclay Cuthbert, who owned, among other things, the foundry where Ivanoff and Serovatsky worked, paid it a visit of inspection. While walking around the place, looking into all sorts of details and asking many questions, he came across Ivanoff standing idle for a moment.

"Who are you and what do you do?" he asked him.

Ivan shook his head to show he did not understand and Cuthbert turned to his Superintendent.

"Any one here who speaks his language?" he asked.

"Yes, sir," replied the Superintendent, and sent for Serovatsky.

"Ask him," said Cuthbert to the little timekeeper, "who he is and what his job is. Ask him if he gets along all right without speaking English."

"Ivanoff," said Serovatsky, "the master wants to know why you are not working."

"The foreman told me to wait here until he came back," said Ivanoff.

"The man says, sir," said Serovatsky, "that he has worked enough to-day; that he works only when he feels like it; and now he feels more like resting."

"Tell him he'd better get busy if he wants to keep his job," said Cuthbert sharply.

"The master says," Serovatsky said to Ivanoff, "that you are an idle, worthless fellow and that he will have you beaten if you are not careful."

"But tell him," protested Ivanoff, "that I am only waiting to be told what to do."

"He says, sir," translated Serovatsky, "that he won't work and that you — Must I translate it, sir?"

"Exactly what he said," jerked out Cuthbert grimly.

"That you are a——" Serovatsky mumbled an unmentionable epithet.

Cuthbert, although he did not make his living by physical labor and was, according to Serovatsky, coddled in the enervating lap of luxury, was nevertheless a red-blooded, two-fisted man. He did not indulge in too much vodka of an evening, but on the contrary kept himself in first-class trim. Therefore, with a right good will and considerable skill, he gave the astounded Ivanoff a very thorough beating.

That night Serovatsky found Ivanoff in his tenement.

"Now do you think we should fight these brutes as if they were men?" he asked him.

"No," said Ivanoff. "Any way at all is good enough for them."

"Are you ready to do your share?"

"Yes," said Ivanoff.

"Very well, then. Now listen carefully. The chief of them all, the War Minister, arrives the day after tomorrow. At ten o'clock in the morning of that day he leaves his hotel to go to one of the forts. You stand on the corner near the door—I will show you the spot.

"When he steps into his automobile you throw into his lap a little toy which we have already prepared. Then—boom! One more tyrant is

answering for his sins, and the slaves all over the world have advanced another step toward liberty. And in the confusion and terror you worm your way out through the crowd and no one knows who did it.

"Risk? Yes, there is, of course; but are you not a brave man? So tomorrow you go back to the foundry and get the pay that is due you. Spend the day in prayer for the delivery of your fellow slaves, and in the evening we will go over the final details. But, Ivanoff——"

"Yes."

"Promise me that to-morrow you will not drink anything but water."

"I promise."

"Promise, too, or rather swear, that if anything should go wrong and you should be caught—though there is little chance of it—that your lips will be sealed. For if the tyrants could, they would exterminate all of us who oppose their will.

"And that they must not do. Our lives are too valuable to the Cause to be wasted when it can be prevented. So therefore each one of us runs the risk for himself alone. When good fortune sends me my turn I do the same, and no news of my brothers shall be learned from me."

"That also I promise, and swear if you like," said Ivanoff. "If they catch me and kill me, it will not help me in my grave to have you lying in the same burying ground."

Serovatsky rested content. He knew what a promise meant to the dull-witted Ivanoff.

Next morning, after Ivanoff had drawn his pay and spent an hour in darning his socks and putting his few clothes in order, he became restless. He was bored, perhaps, if that term can be applied to such a clod as he.

Whatever the proper word to describe his state of mind, the effect of it was that he went out and roamed aimlessly through the streets. He began to feel that his promise not to drink was a great and unjust deprivation, though it did not occur to him to break it.

After a while he came to the railroad station. Now Ivanoff had, of course, seen a railroad before, or as much of it as may run through a city, but in all his life he had never ridden on a train; and just as he blundered into the station a train was about to leave. His restlessness culminated in a burst of adventurous curiosity, and he got aboard it. Buying a ticket beforehand was, of course, a formality beyond his ken, and when the conductor came to collect his fare their lack of ability to understand each other resulted in Ivanoff's paying his way to the end of the run.

In the same car was a sprinkling of soldiers, and seeing them, Ivanoff began to think of what was going to happen the next day. He wondered what the man he was going to kill looked like. He felt a tinge of regret that he would not be able to speak to him first and tell him why he was dying, and that he, Ivanoff, the downtrodden slave, was killing him.

But then he felt the places which were still sore and hurting from his horribly unjust and brutal beating, and his regret vanished. He wondered a little if he would be able to get away, but was not greatly worried; for nothing, either in his inheritance or his environment, had ever taught him to put a high value on individual human life—not even his own. Finally he was brought back to his present surroundings by seeing that the train had stopped at a station where

every one was getting off. Evidently it went no farther, so Ivanoff got off too.

As he stepped down on the platform his breath came a little more quickly and he was conscious of a strange, invigorating tang in the air. It was like that he had breathed on the deck of the steamer, yet somehow it seemed drier and thinner and more life-giving. He looked about him.

What he saw was Space. To one side stretched away a vast, softly undulating plain that ended at the foot of a distant mountain range. On the other side the smooth turf-covered prairie was interrupted for a little distance by the houses and tents of a cavalry cantonment, and then swept away to the distant horizon.

But the dwellings seemed very small and the people walking or riding about among them tiny. He had a feeling that after all they were only incidental and not to be noticed. But that tremendous sweep of open country! He stood still and took a long breath.

While the people from the train streamed away along the roads that led from the station, Ivanoff remained gazing at the strange world into which he had wandered. Presently an officer rode up on a dancing, dainty-footed thoroughbred. A few feet from Ivanoff he dismounted and looked about for a soldier to hold his horse. There was none near, so he called to Ivanoff—

"Will you hold him a minute, please"

Ivanoff, understanding only the gesture, took the bridle, his nerves a-quiver. Scarcely knowing what he did, he reached up his hand to stroke the animal's muzzle—and it was with the slow, deliberate movement of a

man who is used to handling spirited horses.

When the officer having come back Ivanoff started to follow the crowd, his eyes were a little brighter, and his walk a little less shambling. The city, the foundry, the foul, crowded tenement, all seemed a long way off. He went along behind the others until he came to a great oblong field of carefully groomed turf across which were scampering a lot of ponies with bright-shirted riders.

On the sides of the field were gathered many hundred people, and through them Ivanoff edged his way to see what was happening. And what he saw was wonderful and entrhralling. He did not know that he was watching a polo game between the cavalry regiment and a crack team from one of the other islands, but he did know that it was good to watch the nimble-footed little animals galloping about, twisting, turning, checking suddenly, weaving in and out, and out, and then joining in a mad, headlong rush the length of the field.

Fascinated, he pressed forward to the side boards; and once when the ball was knocked out of bounds near where he stood he narrowly escaped being ridden down as one of the players broke through the quickly scattering crowd. But though horse and rider grazed his shoulder as they went plunging past, it did not occur to him to be afraid.

Chapter V.

Ivanoff could not follow the details and intricacies of the game, but no polo enthusiast ever watched an international championship match with more enraptured eyes. It was enough

to see the swift, eager ponies and their reckless riders without bothering one's head with what it was all about.

One man came racing by on a beautiful iron-gray pony, caught the ball a back-handed stroke, checked too sharply, and man and horse went sliding and rolling over the ground together. There was a sudden catching of breath in the crowd and a chorus of horrified exclamations, but Ivanoff did not change expression, though when the man scrambled to his feet and remounted, he smiled approvingly. He was glad he had not been killed, though if he had been, it seemed to Ivanoff, it was all a part of the game—or the fight, he was not quite certain which it was.

When the game was over some magnet drew Ivanoff to the picket line where were tethered the mounts of the visiting team. He stood near by and watched the grooms rubbing the ponies' trim, slender legs, washing their mouths and leading them up and down while they cooled.

With the seasoned ponies which had been ridden in the game were half a dozen green ones that had never yet been played. It was the custom of the island team to bring their young horses, which were still being schooled, to the matches, and let them stand with the old hands at the side of the field, in order that they might grow accustomed to the crowd and the noise and the general excitement in the air.

Among these was one named Gunpowder, a pony which was at once the joy and despair of his owner. No more nearly perfect polo pony was ever foaled, he used to tell his friends. He had the speed of a rifle bullet, the quickness and agility of a mongoose.

intelligence enough to play the game without calling on his rider for constant direction, and the courage to rush unflinchingly into the nastiest of melees. But to all these virtues he added one supreme vice. He did not like to be ridden.

In fact, most of the time he would not be ridden. His master's knowledge of Gunpowder's capabilities had been gained on occasions when the pony had first been reduced to complaisant exhaustion by an hour's work on the longe. Tired out, he had proved himself a wonder. What he would be when fresh no one knew, for the one time he had been tried without the preliminary wearing-out process the man who attempted it had his collar bone broken in the first few seconds.

Ivanoff with unerring eye selected Gunpowder as the object of his most particular admiration. He worked his way to the front of the enlisted men and hangers-on who were clustered about the horses, and came so close that he could almost touch the smooth black coat of the beautiful little horse. There he stood worshipping, and showing the worship in his face.

Now if the island team had not won the match, and if half way through it the head groom had not begun to celebrate the victory with a bottle of square-face gin, what follows could never have happened. But Fate in this case had taken some trouble to lay her plans. The head groom saw the strange, heavy-faced Russian looking at Gunpowder with rapt eyes.

"Hello, there, Russki," he said jocularly. "Some horse, what?"

Ivanoff, guessing the import of the remark, nodded solemnly. Then there came into the groom's head a gin-in-

spired impulse to play what might be an amusing practical joke. He should have been discharged for even thinking of it, for it is not good for a spirited horse to be used as a means to play practical jokes on ignorant Russian laborers. But the groom did not remember that just then.

"How'd you like to ride him?" he asked Ivanoff, making his meaning clear with signs.

Ivanoff nodded again and his eyes lit up. Surely he must be dreaming, but he had no wish to awake.

"Hi, there, one of you fellows! Give me a saddle," the groom shouted to his under-strappers. "While the bosses are over at the club tankin' up we'll have a little sport of our own, beginning with some circus riding by our cow-faced Russian friend."

The other grooms, the soldiers and all the rest of the crowd chuckled with delight and cast anxious glances across the field to the officers' club to make sure that there was no one watching. The groom quickly threw a light saddle on the horse and slipped a bridle with an easy snaffle over his head. He had just enough sense remaining not to use a bit with which an unskilful, heavy-handed man might ruin the animal's mouth. Then he led the horse out in the open.

"Come here," he said to Ivanoff. "And you," he called to another groom, "hold him down on the off side. We want to let our friend get fair in the saddle."

So while the pony was held on each side Ivanoff mounted. Apparently he did it clumsily. Yet he did not flop down in the saddle with any sudden bump to set the horse's highly strung nerves on edge, and his legs took their hold on the flanks very gently and smoothly.

If Ivanoff had been embracing a woman he loved he would not have done it roughly or boisterously; and no woman had ever awakened in him such strange, delicious thrills as did this wonderful animal on whose back he found himself. Not being afraid, he saw no reason to yank and pull at the horse's head, so he grasped the reins lightly, and achieved instinctively just that inimitable touch on the bit that gives the rider control without annoying the horse. The groom stepped back and waited for the circus performance to begin.

Gunpowder, being only a horse, could not reason, but his instinct (remember the derivation of the word "horse sense") told him there was something altogether friendly about the man on his back. He had a feeling that not a hair of his body would be harmed.

For an instant he stood still. He stretched his neck out and pawed at the ground tentatively, and Ivanoff gave him his head to do it. That was beginning well, thought Gunpowder. So he began to walk forward with light, mincing steps, and in a moment broke into an easy canter. As he bounded over the smooth, firm ground headed for the open prairie, and showed no signs of beginning the circus, the head groom shouted frantically for Ivanoff to come back; but in vain. Gunpowder lengthened his stride to a gallop, and with every leap his speed increased. In another hundred yards he was racing off to the mountains as hard as he could run.

Only one who has himself sat on a horse as it gallops at top speed over open country can realize what Ivanoff felt. To no man yet has been given the power to describe that glorious sensation with mere words,

and it were pitiful for me to attempt it.

Gunpowder, unrestrained by his rider, ran as only a horse with racing-blood can run. The rapid, rhythmic thuds of his hoofs rang in Ivanoff's ears, he felt the swift play of bone and muscle under him, his own pulse kept time to the sharp breaths coming from the horse's distended nostrils, the wind whipped in his face and, above all, the wild, irresistible speed of it set his blood on fire.

And Ivanoff had never been on a horse before in his life. But remember that the faster a horse goes the easier it is to sit it—if one only is not afraid. And who was he that he should fear? Do you think that forty years of foul, noisome, crowded cities can undo the work of a thousand years of untrammelled desert life? Do you think it can make a man in whose veins runs the blood of hundreds of wild horsemen afraid of a horse?

As he raced wildly over the plain, Ivanoff, the son of Ivan the dock laborer and slum dweller, died; and there was re-born in his body the son of Ak-Umar, the child of a dozen Turkoman chiefs. He shouted; he threw away his cap; he reached forward and stroked his horse's neck, and presently, as his speed slackened a little, he began to swing around in wide circles—just as his ancestors had swung their horses around the stolid Russian squares.

Chapter VI.

Over on the club veranda Donald MacIntyre, owner of Gunpowder, of hundreds of other horses and of twenty thousand acres on which they pastured, was drinking something fizzy from a tall glass when his eye caught

a rapidly moving speck out on the plain.

"I wonder who that crazy fool is out there," he remarked casually. "Give me your glasses, Bob, and let's take a look."

He focused the binoculars, looked through them a few moments and then put them down with an exclamation.

"It's Gunpowder!" he shouted. "And who it is that can ride him like that, I'd like to know. He's got him under control and is doin' stunts with him. And that horse hasn't been ridden for a month!"

He jumped up and ran over to the picket line, followed by his own team and half a dozen officers.

"Who's on Gunpowder?" MacIntyre asked the head groom.

"It's some Russian who said he was a horse trainer, sir," the groom lied glibly. "He said he could ride 'im, so I let 'im try. I know I shouldn't have done it, sir," he ended meekly.

"Did he have any trouble at the start?" asked MacIntyre.

"No, sir; the little devil walked off with 'im like a lamb."

Before long Ivanoff came cantering back, bare-headed, face aglow, and speaking eager, rapid Russian into Gunpowder's ear. MacIntyre went up to him and stood by the horse's head while he dismounted.

"Who are you?" he asked.

Ivanoff smiled and shook his head.

"Oh, there, you ex-Russian attache!" called MacIntyre to one of the group of officers. "Come here and let us see if you really can speak the lingo. Ask him," he said as a young Captain came forward, "where he learned to ride like that."

Captain Simpson put the question

and looked astonished at the reply he received.

"He says," he translated, "that he's never ridden a horse before."

"Tell him to stop lyin'," said MacIntyre.

"No," said the Captain after a little more talk with Ivanoff, "he strikes me as telling the truth. He says he works at a foundry in town."

"Well," said MacIntyre, "I don't care who he is, or what he is, or whether he knows one end of a horse from the other, he's sure got a God-given instinct for handling 'em. Ask him if he wants a job on my ranch."

Captain Simpson explained.

"Is it like this?" Ivanoff asked, his eyes sweeping over the prairie. "And are there horses there?"

"Thousands of them."

"Tell him yes. I'll come."

Chapter VII.

That night Serovatsky waited in his own quarters for an hour after the time Ivanoff had promised to come. Then he went to look for him.

He found Ivanoff sitting on his cot in the room he shared with three other men. None of these was in and Ivanoff was alone. His elbows rested on his knees, his hands supported his chin, and he was looking off into infinite space, on his face the rapt, expression of one listening to music too divine for human instruments.

Serovatsky's doubts were quieted.

"The clod has come to life," he thought. "Now he will dare anything."

"Ivanoff," he said softly from the open door, "Ivanoff, in thinking of the glory of it one must not forget the practical details. Come, it is time we made the final arrangements."

Ivanoff looked at him puzzled.

"Arrangements for what?" he said.

"Why, for the heroic deed you are to do to-morrow," said Serovatsky, surprised. "For the blow you are to strike for liberty. What else should it be?"

"Oh!" said Ivanoff. "I had forgot-

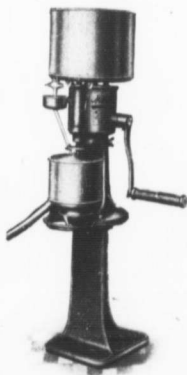
ten. But you see, I can not do it now.

At eight in the morning I leave in a steamship for another country not far from here where I go to work—no, not to work, for it is a place where there are many horses and wide fields. Let me tell you about it."



MOTHER LOST HER JOB

The hand separator and the milk route have taken a big load off mother's back. It used to be mother's job to look after the milk, cream and butter, especially the butter. In the old days, by the time a farmer's wife had taken care of the cream from the milk of fifteen cows and worked it up into pound prints, she wouldn't feel much like gadding around to a meeting of the Ladies' Aid. Sometimes the churning was done with the aid of a club-footed Newfoundland dog, which always wanted to lie down and pant in a hoarse whisper just as the butter was about to reach its destination. Sometimes mother would fasten father to a hand churn with an apron around his stomach, and he would bob up and down and cuss the churn under his breath. Once in a while father would allow his mind to wander, and the churn would wander also and fill both of his eyes full of sour cream. Town people who used to buy fresh, sweet country butter, brought to market every morning, never knew how many side aches and stitches in the back were concealed in every pound. In this respect, at least, the cream separator is a greater boon than a finger bowl at a candy pull.



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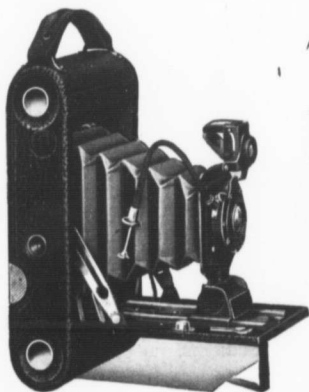
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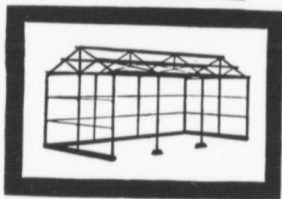
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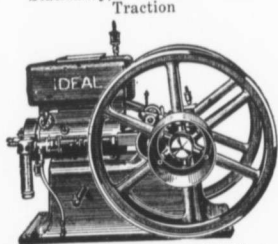
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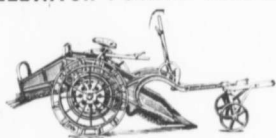


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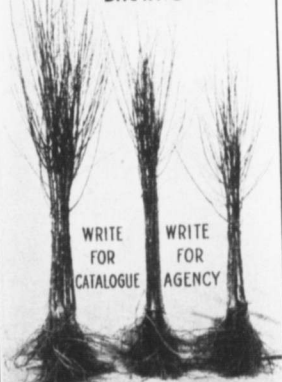
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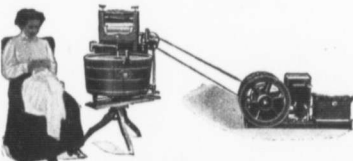
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Wringing by Power.



Washing by Power.

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Dairyman's
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has greatly increased during the past few years owing to a firmer realization that the better the sanitary conditions, the easier it is to produce a higher quality product, and the easier it is to command the better market prices.

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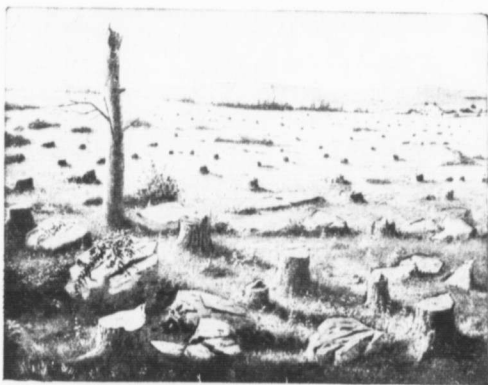
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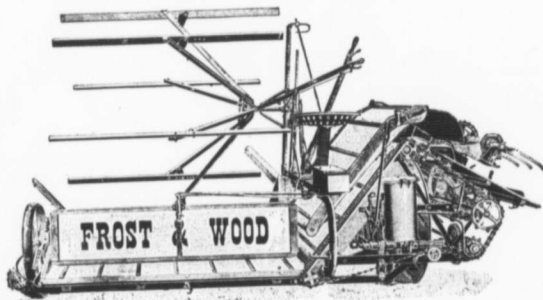
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Satisfaction follows the use of this Separator

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It is easy to fill—easy to turn—easy to clean.

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