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FARM
COUNTING

HIRAM T. SCOVILL

FARM ACCOUNTING

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PREFACE

From the literature on the subject, nearly all of which has been published during the last five or six years, one might be led to think there was something strange and uncommon about the keeping of records of business transactions on the farm. In the last several years, many record books and bulletins on farm bookkeeping and farm costs have been published. With very few exceptions these bulletins deal with the subject from a purely statistical point of view, without involving principles of double entry bookkeeping or the fundamentals of accounting theory. Very often they fail to provide for proper correlation and interpretation of results after they are obtained. These bulletins have proved to be of considerable value, however, in creating a desire on the part of the farmer for a better knowledge concerning his financial condition and progress.

Perhaps the reason the subject is considered in the bulletins from the statistical viewpoint only is found in the fact that double entry bookkeeping has been treated so often in the past as a weird and difficult subject unrelated to anything else, requiring familiarity with a great many rules and the use of a great amount of time to operate. Naturally this would not appeal to the farmer returning from a hard day's work.

It has been the intention, herein, to present the principles of bookkeeping from the common sense viewpoint

only, using a minimum number of rules. In the application of these principles, agricultural operations and transactions are used in three general ways.

1. Showing the financial condition of the farm and the progress it has made without showing the source of loss or gain.

2. Showing the financial condition of the farm and the progress it has made, indicating by properly kept records why the condition is such; that is, indicating the source of loss or gain in a general way.

3. Showing the financial condition of the farm and the progress it has made, using subsidiary cost records for feed and labor, and distributing other expenses so as to show exact costs of production and thus indicate which branches of farming operations pay, and which do not pay on the farm in question.

The arrangement of the subject matter is such that a student who has a working knowledge of bookkeeping might begin with Chapter V. One semester's course of double entry bookkeeping should be sufficient to prepare one for the more specialized farm accounting chapters that follow.

The treatment of some accounting principles herein is not in harmony with the author's ideas of them as applied to commercial accounting. The different conditions, aims and facilities on the farm warrant the departure in most instances.

For example, the titles "Loss and Gain Account" and "Loss and Gain Statement" are used instead of "Profit and Loss," "Profit and Income," "Trading and Profit and

Loss" or other terms in common use in commercial accounting. An expense is not a loss, but a means of making a profit. It is the profit-making agency of a business. Without expenses one cannot expect to make a profit. Nevertheless, this is considered as a distinction not essential to a correct understanding of the interpretation of business transactions in the books of a farm; nor is it essential to the formation of correct conclusions to be drawn from the accounts. The term "Loss and Gain" is used as one which conveys to the average mind the idea of expenses and earnings or income. It is also the one most in harmony with the entries in the account—expenses (losses so-called) to the left, incomes or gains to the right. The name of the account then, as written at the head of the allotted space, indicates on which side of the account an item is to appear—losses or expenses under the word Loss, and gains under the word Gain. Of course, the rules of debit and credit might be applied without any such assistance, but everything possible should be done to make bookkeeping a matter of reasoning rather than a matter of remembering rules.

The method of presentation of the principles of accounting and the art of bookkeeping herein is somewhat unusual. In general, it could be applied in commercial accounting. It has been used by the author in lectures and note form for the past several years. Its use seems partly substantiated at least, as two or three elementary texts published during the last year seem to have used a slightly modified form of this method. It is especially applicable in farm accounting. Students of the latter subject ordinarily do

not have available any higher courses in accountancy in which to study the philosophy or theory of accounts. For that reason, the theory and philosophy are developed along with the methods of analyzing, recording and interpreting transactions.

The logical arrangement of the subject matter in a text of this nature requires special consideration. A study of bookkeeping and accounting is confined to four big branches:

1. The business transactions and adjustments.
2. The accounts involved.
3. The books and records used.
4. The statements and analyses prepared.

One might study the subject for years, but he would not reach beyond the four branches mentioned. In a systematic study, it is not possible to study, first, all about the transactions, then all about the accounts, books and statements in the order mentioned. The four must be studied together, first the simple elements of each, and then the more elaborate elements. The use of this process accounts for some apparent repetitions in the subject matter which are much more apparent than real. The development has been along lines which seemed to be most natural and logical.

Although the four elements of study mentioned should be coördinated to a considerable degree, each one of the four is not considered of equal importance in farm accounting. In these pages, more emphasis is placed on how and why entries are made to interpret transactions or to make adjustments, and not so much on the forms

of financial statements. The farmer, after keeping his own accounts, is able to find from the simple Loss and Gain account and the simple Statement of Resources and Liabilities, all the facts desired from financial statements. Any further analytical results can be prepared in the form of special analytical or statistical tables. In a commercial business, the financial statements occupy a more prominent place because they are largely for the use of people financially interested but who are not familiar with the daily transactions and the accounts. Such people need more elaborate statements in order to assist them in forming opinions as to the progress and condition of the business.

From a pedagogical viewpoint the principles of comparison and correlation used in the development of principles herein should prove quite helpful.

In all cases where there are two or more methods of performing a certain process the illustrations of these methods employ the same set of data. In this way it is plainly brought out that any differences in results, or form of results, are caused by the difference in method rather than the difference in data. The author recently had occasion to examine a text on commercial arithmetic. It was noticed in the discussion of two ways of calculating interest that one set of data was used in illustrating one method and another set in illustrating the other method. As a result, the student trying to absorb the principles for the first time, very probably would not know whether the difference in results was caused by the difference in method or in the original data.

Some attention is also given in these pages to a discussion of the interpretation of results. An intelligent interpretation of results, leading to constructive criticism, is one of the most important factors in the success of any accounting system. This interpretation and criticism is materially strengthened by the use of percentages and tabulated results in various forms.

The use of mixed accounts and the Cash-journal are two principles advocated herein that should prove of material benefit to any one interested in recording farm transactions. They afford a simplicity of operation not equaled by the use of the more highly specialized accounts and books of original entry. The natural increase in live stock and the uncertainty of crop results from a given expenditure of raw materials and labor have no common counterpart in commercial accounting. They therefore require accounts to meet the conditions.

Carefully prepared review questions on the subject-matter of the book are grouped by chapters after the Appendices. They are inserted primarily as a guide to study. By following these questions one may be materially assisted in recognizing the essential points in each chapter.

There are numerous Illustrative Problems following the Review Questions. These problems are carefully graded by chapters and have been prepared with the idea of affording practical application of the principles in connection with each chapter. When used as a text, the problems for a given chapter should be worked immediately after completing a study of the chapter.

Definitions are not presented as the primary basis for

performing various accounting operations. The logical reason is brought out for each step taken. However, definitions or important statements of fact are presented occasionally as a means of summarizing logical conclusions. Such definitions or important statements of conclusion are shown in italics.

It is quite common for a farmer to say that he has no time for keeping accounts. As economic conditions are causing more intensive farming, higher land values and higher rents, it will not be possible much longer to farm in the extensive fashion that has characterized United States farming in the past. It will become necessary to plant those crops, or raise those animals, or use such fertilizer or rotation of crops as prove most valuable under the conditions. A knowledge of what pays best can be most accurately determined by keeping proper accounts.

When economic conditions have so changed as to make it necessary to keep accounts on the farm, the farmer who says he doesn't have time to keep them will be about as well off as if he told the elevator owner to destroy the grain check, as he didn't have time to call for it. In either case he is undoubtedly not getting all that he should from the operation of the farm. The difference is that in one case he knows just how much he is losing (the amount of the grain check); in the other case he does not know how much he is losing.

The changing economic conditions are very well illustrated in a quotation from Dean Eugene Davenport¹ of

¹ *Annals of American Academy*, Vol. XL, pp. 45-50.

the College of Agriculture of the University of Illinois, part of which follows:

"Agriculture has passed through two definite stages of development and is now entering upon a third.

"The first stage was called the self-sufficing system. Each family produced enough to keep itself until the next harvest.

"The second stage was called the money-making stage. It arose about the time of the Civil War, when some states became wealthy from the production of wheat. The Western States created wealthy farmers who bought land for \$1 or \$2 an acre, and robbed the soil of its elements to make money. This land is worth now from \$100 to \$250 per acre. This exhaustive money-making period caused the rise of the third period.

"The third stage is called the scientific stage. It is scientific as to the feeding of animals, fertilizing (replenishing) the soil, dairying, sanitation, marketing, management, organization. Chemistry was the first science to come to the aid of agriculture; economics is the latest.

"Now, however, when the public domain is practically exhausted, competition for land will raise its price, food values must go up, for the farmer must realize income on his capital as well as on labor, and his business is gradually assuming the form of other capitalized industries."

A feature of farm accounting that is often overlooked is that of dealing with the investment of money after it is earned. A discussion is given herein, of the ways of investing in safe but profitable income-producing assets. This is considered as being of essential economic impor-

tance to the farmer and his community since the past has demonstrated that many farmers who made a profit from the soil did not know how to conserve nor properly utilize their newly earned resources.

Other topics having a somewhat direct bearing on the business affairs of the farm are presented in more or less detailed manner, e.g., financing the farm, preparing the federal income tax schedule, borrowing under the Rural Credits Law, household accounts analyzed, calculation of interest, the use of common business papers and other points.

It is not intended that the forms presented in this book shall be used without first understanding the principles back of their use. An intelligent use of the books and records described will only follow a careful study of the principles. Simplicity, clearness and accuracy constitute the framework upon which we have endeavored to construct farm accounts.

For assistance in obtaining practical data for some of the problems, and for participation in intelligent and helpful discussions on farm accounts, I wish to express my appreciation of the work of Mr. F. A. Pearson of the Dairy Husbandry, and Professor W. F. Handschin and Mr. J. B. Andrews of the Animal Husbandry departments of the College of Agriculture of the University of Illinois. I appreciate, also, the able assistance rendered by my colleague, Mr. A. C. Littleton, in examining and offering suggestions on the manuscript.

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FARM ACCOUNTING

CHAPTER I

BOOKKEEPING AND BUSINESS TRANSACTIONS

Accounting and Bookkeeping.—The art of classifying and recording business transactions and facts systematically is called bookkeeping. Accounting is that branch of practical science which treats of the methods of classifying and recording business transactions so that the facts they exhibit shall be shown in their proper relations.

It is seen from the definitions that bookkeeping and accounting deal with the interpretation of business transactions.

Books of Account.—Business transactions interpreted according to accounting principles are recorded in a permanent written form in books of account. Such books are usually ruled with horizontal lines in blue; and with vertical lines in blue or red. The vertical rulings are made to provide columns for recording values of transactions in dollars and cents.

In interpreting and recording a transaction, it is not necessary that all the details be shown. It is expected, however, that all the essential points will be shown. For example, Mr. Arnold buys a horse of Mr. White, and pays him \$150 in cash. This is a business transaction. It might be that the completion of the sale involves several offers and counter offers, and several affirmative or negative state-

ments concerning the qualities of the horse. From the bookkeeping and accounting point of view what are the essentials and what are the non-essentials of this transaction? Which facts concerning the transaction are to be interpreted and which are not to be interpreted in the books of account of Mr. Arnold?

The Essentials of a Transaction.—One of the most essential elements of the transaction in question is the value, in this case \$150. Another is the form in which the value was measured, namely, horse and cash. In a correct interpretation of the transaction mentioned, then, we should at least show that cash and a horse were involved to the extent of \$150. We should record the date on which the transaction occurred. We might find it desirable also to show the name of Mr. White, and also the specific name of the horse for future reference. Our interpretation on the books of account need not state anything concerning the offers and counter offers nor the statements made concerning the qualities of the animal. They are considered as non-essentials for the purpose of bookkeeping records.

The exact form that this interpretation of the transaction should assume on the books of account will be discussed when we have investigated the use to be made of the transactions after they are recorded.

The Use of Accounting Information.—If a man could remember all of his business transactions during a year and the values concerned, he would not need to keep any written record of them, unless it might be for the benefit of those who succeeded him, or for comparison of one year's results with another.

It is quite natural, then, from our knowledge of the memory possessed by the average man, to assume that one who indulges in business transactions should keep a record of them, if he wishes to classify them in any way or

find the aggregate of his transactions for any particular purpose. The most general reasons for one's wanting aggregate figures concerning his business are:

1. To show his true financial worth at any time.
2. To show whether he is the possessor of more or less wealth now than at some definite former time, and what form this increase or decrease assumes.
3. To show what elements have contributed to this increase or decrease in wealth.

Statement of Resources and Liabilities.—The aggregate of business transactions that shows the financial worth on a given date is called a Statement of Resources and Liabilities or Balance Sheet. It contains a list of the Resources and a list of the Liabilities with the money values of each indicated.

A resource is anything of value owned by or owing to a given individual. It is better defined as property or right to property. For example, Mr. Arnold's resources of \$5000 might consist of cash \$1000, horses \$1600, cattle \$1100, and equipment valued at \$800, all of which would be classed as property, and a debt owing to him by Mr. Bell for \$500, which might be called Arnold's right to property in Bell's possession. At law this \$500 owing from Bell is considered as Personal property of the type known as choses (things) in action. Resources are often called Assets. Some attempt has been made to distinguish between the two terms, but they may be used interchangeably.

A liability is an amount which is owed to someone. It might be called the right of someone else to property of the individual whose records show the liability. For example, Mr. Arnold's liabilities of \$1000 might consist of a mortgage on the equipment for \$700 and a note payable to the bank for \$300, which Mr. Arnold is expected to pay in 30 days. These are known as mortgages payable and

notes payable respectively. Both of these represent the right of someone else to property of Mr. Arnold.

The difference between the amounts of the resources and liabilities is the financial worth or net worth of the individual or organized business. Net Worth is sometimes better known as Capital or Net Capital. In the case just cited, Mr. Arnold with resources of \$5000 and liabilities of \$1000 would have a net worth or capital of \$4000 (\$5000—1000).

His statement of Resources and Liabilities would appear as in Illustration 1 at the time his resources and liabilities bore the values mentioned.

ILLUSTRATION 1

STATEMENT OF RESOURCES AND LIABILITIES

FEBRUARY 29, 1916—MR. ARNOLD

<i>Resources</i>	
Cash.....	\$1,000
Owing by Mr. Bell.....	500
Horses.....	1,600
Cattle.....	1,100
Equipment.....	800
Total Resources.....	<u>\$5,000</u>
<i>Liabilities</i>	
Mortgage payable.....	\$700
Note payable.....	300
Total Liabilities.....	<u>1,000</u>
Net Resources.....	<u>\$4,000</u>
(Net Worth or Mr. Arnold's Net Capital) .	<u><u> </u></u>

The statement is sometimes presented in another form, as in Illustration 2.

ILLUSTRATION 2

STATEMENT OF RESOURCES AND LIABILITIES

FEBRUARY 29, 1916—MR. ARNOLD

<i>Resources</i>		<i>Liabilities</i>	
Cash.....	\$1,000	Mortgage payable....	\$700
Owing by Mr. Bell....	500	Note payable.....	300
Horses.....	1,600	Net Capital (or Mr.	
Cattle.....	1,100	Arnold's Capital)...	4,000
Equipment.....	800		
	<hr/>		<hr/>
	\$5,000		\$5,000
	<hr/>		<hr/>

Comparison of Statements.—The second of the three reasons for wanting aggregate figures, as already enumerated on page 3, can be briefly illustrated by assuming that a Statement of Resources and Liabilities as compiled from Mr. Arnold's records, appeared one year later, February 28, 1917, as in Illustration 3.

ILLUSTRATION 3

STATEMENT OF RESOURCES AND LIABILITIES PREPARED FROM

APPRAISAL, FEBRUARY 28, 1917—MR. ARNOLD

<i>Resources</i>		<i>Liabilities</i>	
Cash.....	\$1,000	To outsiders (none)	
Owing by Mr. Bell....	500	Arnold's capital a/c...	\$5,000
Horses.....	1,600		
Cattle.....	1,100		
Equipment.....	800		
	<hr/>		<hr/>
	\$5,000		\$5,000
	<hr/>		<hr/>

We see from a comparison of the net capital of Mr. Arnold February 29, 1916, with his net capital February

28, 1917, as shown in Illustrations 2 and 3, that he is worth \$1000 more on the latter date than on the former.

Upon closer examination of the two statements we notice that the resources are exactly the same in every detail, while the liabilities of \$1000 at February 29, 1916, do not exist at February 28, 1917. Evidently, Mr. Arnold during the year has paid off the \$700 mortgage on the equipment and the \$300 loan at the bank. How, then, do his resources remain the same? He probably paid the two obligations in cash. Why, then, is the cash balance the same at the end of the second year as it is at the end of the first? Is it not probably due to the fact that Mr. Arnold, as a result of his farming operations during the year, received \$1000 in cash over and above his expenditures for labor and other items, which \$1000 he used to pay off his existing liabilities amounting to \$1000? In other words, did he not make \$1000 profit? This is the most natural assumption as to what the transactions were which resulted in the decrease of the liabilities at February 28, 1917, compared with February 29, 1916, without causing a change in the resources at the two dates mentioned. A change in the resources occurred during the year, perhaps several times, but the statement of resources and liabilities does not show the changes or progress during the year. It shows only the conditions at the close of a year. Comparing it with the close of the preceding year we see that the Net Worth is \$1000 greater.

If we are to form a general idea of what changes took place during the year to cause the \$1000 increase in Net Worth, as reflected in the Statement of Resources and Liabilities, it will be necessary to have further details concerning the operation of Mr. Arnold's business.

This brings us to the third reason, mentioned for wanting certain aggregate results of the year's operations

shown in money values, namely to show what elements have contributed to this increase or decrease in wealth.

Loss and Gain Statement.—If Mr. Arnold had kept records in only a comparatively brief form, we might be able to present some aggregate figures to show how the \$1000 increase arose. We should prepare for this purpose a Loss and Gain Statement from the figures at our disposal in Mr. Arnold's records. Such a statement would show the expenses incurred in running the farm and the incomes derived from the sale of farm products. We shall assume in this case, that Mr. Arnold's records contained sufficient information for the preparation of a Loss and Gain Statement as in Illustration 4. *The Statement of Resources and Liabilities and the Loss and Gain Statement when used collectively are known as Financial Statements.*

ILLUSTRATION 4

LOSS AND GAIN STATEMENT PREPARED FROM IMAGINARY DATA
FOR THE YEAR ENDING FEBRUARY 28, 1917—MR. ARNOLD

<i>Expenses and Losses</i>		<i>Incomes and Gains</i>	
Rent.....	\$400	Milk Sold.....	\$300
Labor.....	300	Corn Sold.....	1,200
General expenses.....	300	Oats Sold.....	400
Balance, gain for the yr.	1,000	Miscellaneous income.	100
	<u>\$2,000</u>		<u>\$2,000</u>

Analysis of the Financial Statements.—The brief analytical statement presented in Illustration 4 shows, in a general way, how Mr. Arnold was enabled to pay off his mortgage and bank loan amounting to \$1000, without permanently decreasing his resources to do it. He sold milk for \$300, corn for \$1200, oats for \$400, and miscellaneous products (probably fruit and garden truck) for \$100, mak-

ing a total of \$2000. His expenses were, for rent, \$400, for labor \$300, and general expenses \$300, a total of \$1000. If he received cash for all the products sold, and paid cash for all the expenses, it would mean that he received \$2000 during the year from farming operations which cost him only \$1000. The other \$1000 represents profit and was used to pay off his mortgage and bank loan.

The Loss and Gain Statement discussed above, shows the elements contributing to the increase in wealth only in a very general way. A more detailed treatment of this is taken up in connection with the subject of Cost Accounting.

Having examined the Statement of Resources and Liabilities, and compared one year's statement with another; and having observed the relation of the Loss and Gain Statement to them, we have seen in a general way what the object is in keeping records of business transactions. *Briefly stated, the object in keeping books of account is to furnish the essential facts from which one can find the financial condition of the business at any given date, and the progress of the business over a given period of time. The Statement of Resources and Liabilities shows the condition, while the Loss and Gain Statement shows the progress.*

Remembering that these statements are to present facts and results in the aggregate, at least once a year (or oftener if desired), we shall try to find out how the records are kept from day to day so that this valuable information may be readily obtainable in a good form that is easily understood.

There are two essential points to bear in mind in keeping the records during the year:

1. Classification of the transactions.

(In what detail are the transactions to be analyzed,

and what information is to be recorded concerning each?)

2. Method of recording transactions.

(How is the information to be recorded so that it can be condensed as much as possible and still be specific and easily utilized in preparing the annual statements?)

The second of these points (the method of recording transactions) is the one that involves more of the art of bookkeeping and science of accounting. It is discussed in the next chapter on Ledger Accounts, and in the chapter on Books of Original Entry.

Briefly, the first point, the detail of analysis of transactions, involves a decision as to what information is wanted at the close of the year or other time. We might decide that in our Statement of Resources and Liabilities we want to show the value of binders, mowers, plows and other implements separately instead of grouping all of them under the head "equipment." If we do, it is only necessary so to keep the records throughout the year that this detailed information will be available. Likewise if we want to show the income from sale of oats and corn separately in the Loss and Gain Statement, we can do so by keeping our records during the year with that idea in mind.

ILLUSTRATIVE PROBLEMS

The following problems should be prepared on ledger paper in neat form, using Illustration 2 as a guide for Statements of Resources and Liabilities:

1. Mr. Black, on March 1, 1916, has resources as follows: Cash \$600, swine \$700, poultry \$100, horses \$1200, equipment \$400, and a promissory note signed by Mr. Peck for \$200. His only liability is \$60 owing to Mr. Thomas, a neighbor who loaned it without security.

Prepare a Statement of Resources and Liabilities for Mr. Black as of March 1, 1916.

2. On February 28, 1917, Mr. Black's resources are as follows: Cash \$1000, swine \$700, poultry \$100, horses \$1200, equipment \$400, and a promissory note signed by Mr. Peck for \$200. There are no liabilities to outsiders.

Prepare a Statement of Resources and Liabilities for Mr. Black as of February 28, 1917.

3. Referring to problems 1 and 2 above,

(a) What was Mr. Black's net capital or net worth at the beginning of the year, March 1, 1916?

(b) How much was it at the close of the year, February 28, 1917?

(c) How much better off was Mr. Black's business at the close of the year than at the beginning?

(d) What resources were valued at the same figure at the close as at the beginning?

(e) What resources were valued at a greater figure at the close than at the beginning of the year?

(f) What change was there in liabilities at the close compared with the beginning of the year?

(g) State what general conditions or activities during the year probably caused these changes in resources and liabilities.

4. Mr. Weld on March 1, 1916, values his resources as follows: Cash \$1000, cattle \$900, horses \$1400, sheep \$600, equipment \$500, buildings \$5000, land \$10,000. His liabilities consist only of a mortgage on the land of \$1000.

Prepare a Statement of Resources and Liabilities for Mr. Weld as of March 1, 1916.

5. On February 28, 1917, Mr. Weld's resources are as follows: Cash \$1000, cattle \$900, horses \$1400, sheep \$600, equipment \$800, buildings \$5000, land \$10,000. He has no liabilities to outsiders.

Prepare a Statement of Resources and Liabilities for Mr. Weld as of February 28, 1917.

6. Referring to problems 4 and 5 above, answer the questions concerning Mr. Weld's business that were asked concerning Mr. Black's business in problem 3 above.

7. Mr. Smith on March 1, 1916, has property with the following values: Cash \$1200, swine \$600, horses \$1800, cattle \$1000, poultry \$60, equipment \$700, buildings \$4000, and land \$12,000. He owes \$100 on a promissory note at the bank.

Prepare a Statement of Resources and Liabilities for Mr. Smith as of March 1, 1916.

8. On February 28, 1917, Mr. Smith's resources consist of the following: Cash \$1400, swine \$600, horses \$1800, cattle \$1000, poultry \$60, equipment \$1000, buildings \$4000, and land \$15,000. His only liability is a mortgage on real estate of \$2000.

Prepare a Statement of Resources and Liabilities for Mr. Smith as of February 28, 1917.

9. Referring to problems 7 and 8 above, answer the questions concerning Mr. Smith's business that were asked concerning Mr. Black's business in problem 3 above.

10. Mr. White finds that his income for the year ending February 28, 1917, was derived from the following sources: sale of corn \$1400, sale of oats \$900, sale of swine \$700, miscellaneous sales \$200. His expenses were for labor \$400, rent \$500, general items \$700.

(a) Prepare a Loss and Gain Statement for Mr. White's business for the year ended February 28, 1917.

(b) Is Mr. White's net capital greater or less than at the beginning of the year? How much?

11. The Mr. Smith mentioned in problems 7 and 8 above finds that his income for the year ended February 28, 1917, was derived from the following sources: sale of wheat \$700, sale of swine \$200, sale of milk products \$300, sale of corn \$800, sale of timothy hay \$100, sale of fruit and garden truck \$100, sale of oats \$600. His expenses were for labor \$500, interest on mortgage \$60, general items, \$640.

Prepare a Loss and Gain Statement for Mr. Smith for the year ended February 28, 1917.

12. Referring to problem 11 above,

(a) Is Mr. Smith's net capital greater or less than at the beginning of the year?

(b) How much?

(c) What was Mr. Smith's total income?

(d) Assuming that this figure represents the amount of cash he received from the sale of the products mentioned, state how that cash was probably used before the close of the year. For this purpose refer to the figures in problems 7 and 8 which indicate that he had only \$200 more cash at the close than at the beginning.

REVIEW QUESTIONS

1. What is bookkeeping?
2. What is accounting?
3. What are three of the essentials of a business transaction, from a bookkeeping viewpoint?
4. Name three general reasons for wanting aggregate figures concerning business financial operations.
5. What is a Resource?
6. What is a Liability?
7. What is Net Worth?
8. In general what does a Statement of Resources and Liabilities contain? In what two general forms may it be prepared?
9. Explain how Mr. Arnold can pay off Liabilities of \$1000 during the year and yet have his Resources at the close of the year valued at the same figure as at the beginning.
10. What is the purpose of a Loss and Gain Statement? What is its relation to a Statement of Resources and Liabilities?
11. What is it necessary to do during the year in order to have information available at the close of the year for a Loss and Gain Statement and a Statement of Resources and Liabilities?
12. What two main points are to be considered in keeping a record of business transactions during a year?
13. Why are the Statements illustrated in this chapter shown with the year ending February 28, rather than December 31?

CHAPTER II

THE LEDGER

The Importance of the Ledger in Accounting.—After it is decided how many details are wanted in the financial statements at the close of the year, or how much special information might be wanted during the year, there might be one of several methods chosen by which to record the transactions that affect the year's results.

They might be recorded:

1. In narrative or diary form without the use of technical bookkeeping abbreviations.
2. Directly in the ledger accounts involved.
3. In a journal, cash book or some other book of original entry, from which they would be posted to the ledger accounts.

The third method is the one used in practice. It is discussed in the chapter dealing with books of original entry.

The second method is taken up later in this chapter, not because of its practical nature (although it might be used where transactions are involved), but because of the opportunity it affords for an explanation of debits and credits, capital and income, and a general discussion of accounts which are the basic elements in bookkeeping or accounting. With the use of the journal and cash book, as mentioned under method 3, the ledger accounts are the final resting places of all data collected. All data for subsequent use in finding the condition or progress of the business are taken from the ledger. In other words, *all essential information goes into the ledger, and all auxiliary*

tabulations and statements are prepared primarily from the ledger.

Books could be kept, transactions recorded, financial statements prepared, constructive criticisms made concerning a business, and in fact all essential bookkeeping purposes served from the proprietor's viewpoint without the use of any other book than a ledger.

Accordingly the ledger is used at this time because of the opportunity it affords for presenting the essential principles and scope of bookkeeping without the use of unnecessary details.

The first method of recording business events, which would show the transactions in narrative form as they took place from time to time, might present the information in some such unscientific way as this, using Mr. Arnold's transactions as summarized on pages 4 and 5.

March 1, 1916, I (Mr. Arnold) have \$1000 in the bank; Mr. Bell owes me \$500; my 12 head of horses are worth \$1600; my 20 head of cattle are worth \$1100; the equipment is worth \$800; I owe \$700 on a mortgage held by Wade & Co., on my equipment; I also owe \$300 to the bank on my 90 day note.

March 30, paid \$300 to bank to redeem note and paid \$6 interest.

March 31, paid \$30 to hired man; and paid \$20 for general expenses.

April 16, paid \$60 for insurance and taxes; and received \$40 check for milk sold to creamery.

April 30, paid \$30 to hired man for April.

May 16, received a \$60 check for milk sold.

May 20, paid \$10 for sundry items in town.

May 31, paid \$30 to the hired man for May.

June 16, received a \$65 milk check.

June 28, sold some fruit and garden truck for \$20.

June 30, paid hired man \$30.

July 16, received milk check for \$50.

July 31, paid for labor, two men, \$60.

August 16, received milk check \$20.

August 18, sold oats for \$400.

August 31, paid \$30 for labor.

September 10, paid for general expenses during threshing season, \$25.

September 16, received milk check \$25 and paid \$40 for general expenses.

September 30, paid \$30 for labor for September.

October 7, sold some garden truck and fruit for \$60.

October 16, received milk check, \$25.

October 31, paid \$30 for labor in October and paid \$25 for general expenses.

November 16, received milk check for \$15.

November 18, sold garden truck for \$20 cash.

November 30, paid \$30 for labor in November.

December 6, sold corn for \$12 cash.

December 10, paid off the \$700 mortgage to Wade and Co., and \$42 interest.

December 20, paid for sundry items \$32.

January 31, 1917, paid \$20 for sundry items in January.

February 20, paid \$20 for sundry items in February.

February 21, paid rent for year \$400.

We might say that the notations made above concerning the business transactions of Mr. Arnold constituted his record for the year, from which he could make his principal statements, showing his Resources and Liabilities and Losses or Gains.

It is true that he could take the figures given and prepare the statements. In order to do that, however, it would be necessary to perform certain processes of addition and subtraction, which would follow a separation of the transactions into groups.

Bookkeeping Abbreviations.—Just what groups should be formed and what titles these groups should bear are points that involve the principles of bookkeeping and accounting.

The recording of the transactions named above, and in fact the recording of any business transactions according to bookkeeping methods, involves a knowledge of the abbreviations used in bookkeeping.

A baseball game is reported for a newspaper by a presentation of the box score. The box score is merely an abbreviated way of stating the essential facts in the ball game. Essential, here, refers to those facts that are most likely to be used for reference in the future in compiling fielding and batting averages. One cannot readily interpret the essential features of the ball game from the box score, unless he is familiar with the abbreviations used in showing the number of hits, runs, errors, assists, and put-outs.

We are confronted every day with the use of abbreviations in some way or other for the purpose of presenting facts in a brief but intelligible manner. They are used in the preparation of railroad time tables, market quotations, and other common ways.

Bookkeeping abbreviations involve the systematic interpretation of business transactions in the books of account. Such interpretation is founded on the fact that every business transaction has a double effect, which needs recording. For example, if Mr. Arnold pays cash for some horses, he decreases his property in the form of cash and increases it in the form of horses. The bookkeeping abbreviations, then, must show this twofold effect, in order to present the facts properly.

Before illustrating or discussing the bookkeeping abbreviations, it is advisable to find out what is meant by some of the terms used in this connection.

Business Transaction.—*A business transaction is a negotiation between two or more persons which affects the value of the property of either or both. Usually something of value is given by each party to the negotiation,*

but this is not necessary. If Mr. Arnold gives \$10 to a beggar, it is a business transaction even though the beggar does not give anything of value in exchange for the money.

Value.—Anything that has worth, purchasing power, or exchangeable utility is said to have value. Thus, property, uses and services have value. Uses are best represented in bookkeeping by interest on money. Services are best represented by wages or salaries earned.

Property.—Anything that a person owns is his property. Legally, property is divided into two classes (1) real and (2) personal. Real property consists of real estate, including any attachments thereto, as buildings, fences, trees and crops which grow up from year to year without replanting.

Personal property includes all other possessions of man. It is generally divided into two classes, (a) corporeal and (b) incorporeal. The corporeal includes all movable, tangible property, while the incorporeal is best represented by a legal right to property, known as choses (things) in action. Thus when Mr. Bell owes Mr. Arnold \$500, Mr. Arnold is said to possess personal property worth \$500. His property in this case is not tangible. It is incorporeal.

In bookkeeping, this type of incorporeal property is listed under the name of the individual who owes it, rather than under a general title of property or incorporeal property. Accounts Receivable is the general title given to such incorporeal property in books of account.

Capital.—Capital is the difference between the resources and the liabilities of an individual. In a business enterprise capital is the difference between the resources and liabilities to those not owning the business. In other words, it is the property belonging to the owners of the business

with no claims whatever against it. The economist defines capital as "wealth used in the further production of wealth." He, therefore, considers all of the resources as capital regardless of the claims against them by outside parties.

It is the common practice in bookkeeping to show the capital under various headings to signify the nature of the property, horses, cattle, cash, etc. Under another heading, however, is shown the net total of all the capital. This latter heading is usually called the proprietor's capital account, meaning that it shows the capital invested by the proprietor or owner—the property which is available for his personal use after debts to all outside parties have been paid.

It should be borne in mind that the true capital of a business is its net resources. The capital account of the proprietor merely represents net capital in the aggregate.

Account.—*An account¹ is the exhibit of the bookkeeping effects resulting from transactions involving a particular person, thing, or class of things. The name of that person, thing, or class of things is written at the top of the account.*

Debits and Credits.—It is customary to divide the account into two equal parts by means of a perpendicular line, the left hand part being known as the debit side and the right hand part as the credit side. All items on the debit side are known as debits and all items on the credit side as credits. "Debit" is used interchangeably with "charge."

An account is not complete unless the date of each item is shown, together with such other data as conditions require—such as the folios of pages from which the items are posted, and explanations of particulars bearing upon

¹ Bentley's "The Science of Accounts."

those items sufficient to make the entry clear. Illustration 5 shows an account called Mr. Arnold's Capital.

Ledger.—*The book in which the accounts of a business are kept is called a ledger.* The ledger is ruled in such a way as to permit the accounts to be shown according to the principles stated above. It is divided into two parts by a perpendicular line. A column in which to express values in dollars and cents is provided at the extreme right of each half of the page. Date columns, explanation columns and reference columns are also provided in the usual ledger page. One or more pages of the ledger may be reserved for each account; or more than one account may be placed on a single page. Entries in the ledger should be made in ink, the term "entry" meaning the recording of debits and credits for a transaction.

Accounts Illustrated.—The point has now been reached where an illustration of some of the ledger accounts should be studied. The ledger accounts illustrated on the pages immediately following have been created from the series of transactions of Mr. Arnold given on pages 14 and 15. The accounts also illustrate some of the universal bookkeeping abbreviations in use, and illustrate the second of the three methods of recording transactions referred to at the beginning of this chapter, namely, recording them in the ledger accounts direct.

Unless these abbreviations are studied and fixed logically in mind one cannot expect to be able to create ledger accounts intelligently from business transactions. An effort should be made to trace each transaction into the accounts, remembering that each one is shown in its twofold effect upon the values of the business. In other words, each transaction has an entry on the left side of one account and on the right side of another account. The dates can be used advantageously in tracing the transactions into the accounts.

ILLUSTRATION 5

LEDGER ACCOUNTS WITH PROPRIETOR'S CAPITAL, PROPERTY AND LIABILITIES

DEBIT ¹	<i>Mr. Arnold's Capital</i>	CREDIT ¹
1916		1916
Mar. 30 General expense (Interest) \$6		Mar. 1 Capital invested \$4,000
Mar. 31 Hired man's labor 30		Apr. 16 Milk 40
Mar. 31 General expense.. 20		May 16 Milk 60
Apr. 16 General (Ins. and taxes) 60		June 16 Milk 65
Apr. 30 Hired man's labor 30		June 28 Fruit and Gar- den truck 20
May 20 General expense.. 10		July 16 Milk 50
May 31 Hired man's labor 30		Aug. 16 Milk 20
June 30 Hired man's labor 30		Aug. 18 Oats 400
July 31 Hired man's labor 60		Sept. 16 Milk 25
Aug. 31 Hired man's labor 30		Oct. 7 Garden truck and fruit 60
Sept. 10 General expense.. 25		Oct. 16 Milk 25
Sept. 16 General expense.. 40		Nov. 16 Milk 15
Sept. 30 Hired man's labor 30		Nov. 18 Garden truck... 20
Oct. 31 Hired man's labor 30		Dec. 6 Corn 1,200
Oct. 31 General expense.. 25		
Nov. 30 Hired man's labor 30		
Dec. 10 General expense (Interest) 42		
Dec. 20 General expense.. 32		
1917		
Jan. 31 General expense.. 20		
Feb. 20 General expense.. 20		
Feb. 21 Rent for year 400		
Feb. 28 Bal. down, Net Capital 5,000		
	<u>\$6,000</u>	<u>\$6,000</u>
		1917
		Mar. 1 Bal. brought down \$5,000

¹ The words "debit" and "credit" are placed on the left and right sides of the account, respectively, for illustrative purposes. In practice they are seldom written at the head of an account in this way.

DEBIT

Cash

CREDIT

1916	
Mar. 1 On hand.....	\$1,000
Apr. 16 Milk.....	40
May 16 Milk.....	60
June 16 Milk.....	65
June 23 Fruit and Gar-	
den truck....	20
July 16 Milk.....	50
Aug. 16 Milk.....	20
Aug. 18 Oats.....	400
Sept. 16 Milk.....	25
Oct. 7 Garden truck,	
etc.....	60
Oct. 16 Milk.....	25
Nov. 16 Milk.....	15
Nov. 18 Garden truck..	20
Dec. 6 Corn.....	1,200

\$3,000

1917

Mar. 1 Bal. on hand... \$1,000

1916	
Mar. 30 Note pay.....	\$300
Mar. 30 Interest.....	6
Mar. 31 Labor.....	30
Mar. 31 General.....	20
Apr. 16 Ins. and Taxes.	60
Apr. 30 Labor.....	30
May 20 General.....	10
May 31 Labor.....	30
June 30 Labor.....	30
July 31 Labor.....	60
Aug. 31 Labor.....	30
Sept. 10 General.....	25
Sept. 16 General.....	40
Sept. 30 Labor.....	30
Oct. 31 Labor.....	30
Oct. 31 General.....	25
Nov. 30 Labor.....	30
Dec. 10 Mortgage pay.	700
Dec. 10 Interest.....	42
Dec. 20 General.....	32

1917

Jan. 31 General.....	20
Feb. 20 General.....	20
Feb. 21 Rent.....	400
Feb. 28 Bal. down (on	
hand).....	1,000

\$3,000

FARM ACCOUNTING

Mr. Bell

1916

Mar. 1 Balance due . . . \$500

Horses

1916

Mar. 1 On hand (12) . . \$1,600

Cattle

1916

Mar. 1 On hand (20) . . \$1,100

Equipment

1916

Mar. 1 On hand \$800

Mortgage Payable

1916

Dec. 10 Cash paid \$700

1916

Mar. 1 Nat'l Implement
Co. \$700*Notes Payable*

1916

Mar. 30 Cash paid \$300

1916

Mar. 1 First Nat'l Bk.
(90 days) . . . \$300

Analysis of the Entries.—Without stating any conventional rules, it is essential that the entries in the accounts should be examined further and analyzed in such a way as to lead to the conclusion that they are made in accordance with some well defined customs, or principles.

Taking up the first transaction presented on March 1, 1916, in Mr. Arnold's narrative of events as given on pages 14 and 15, we find that Mr. Arnold invests certain properties in the business. In deciding on a way of interpreting this transaction in the ledger, we must decide what accounts are affected, and in what way they are affected. Obviously, in this transaction, Mr. Arnold's Capital account is affected because he is contributing capital to the business. Each one of the property accounts would be affected in so far as they designate a specific kind of property invested. Also, the accounts representing liabilities to other parties would be involved, since they are considered in the determination of the original capital invested.

In brief, this transaction gives rise to the opening entry for the purpose of opening a double entry set of books. It is called double entry because of the twofold effect of each transaction. This is illustrated in the following discussion of entries.

The net amount of Mr. Arnold's investment, \$4000, is placed on the right or credit side of his Capital account and is offset by the entries to the property and liability accounts which make up his investment. The item \$1000 is placed on the left or debit side of Cash account, to show cash received into the business. On the left or debit side of Mr. Bell's account is placed the item of \$500 to indicate the investment of property which is really a legal right to \$500 worth of the property of Mr. Bell. Mr. Bell owes the business \$500. Horses, Cattle and Equipment accounts have \$1600, \$1100 and \$800 respectively

placed on the left or debit side to indicate specific types of property received into the business. On the right hand or credit side of Mortgage Payable and Notes Payable accounts are placed the items of \$700 and \$300 respectively, to indicate amounts owing by the business.

It appears, then, that in opening a set of books, all the resources are placed on the left or debit side of the appropriate ledger accounts and all liabilities on the right or credit side. The difference is credited to the capital account of the proprietor. This last amount is really a liability of the business to the owner, or the owner's claim against the property of the business. The claim of the owner is, of course, a secondary claim to be settled after the others have been paid.

It should be noticed that in the transaction, just discussed, the sum of the amounts placed on the left or debit side of the various accounts is \$5000 (\$1000 Cash, \$500 Mr. Bell, \$1600 Horses, \$1100 Cattle, \$800 Equipment) and the sum of those placed on the credit side is \$5000 (\$4000 Arnold's Capital, \$700 Mortgage Payable and \$300 Notes Payable). *In other words, the sum of the debits resulting from the transaction is equal to the sum of the credits. This should be true of every transaction recorded in the books.*

The next transaction of Mr. Arnold's as given on page 14 is the payment of \$300 to redeem his note held by the bank and a payment of \$6 for interest thereon. As for the \$300 payment, it decreases a resource in the form of cash and decreases a liability in the form of notes payable. Accordingly, the entries should involve these two accounts in such a way as to show a reduction of \$300 in each. The bookkeeping form requires these to be made on the credit or right hand side of Cash account and on the left hand or debit side of Notes Payable account. (See pages 21 and 22.)

If we were not required to conform to the universal

bookkeeping abbreviations referred to previously, we might have this transaction appear in the two accounts as follows:

Cash

1916	
Mar. 1 On hand.....	\$1,000
Mar. 30 Less paid on note.....	300
	<hr/>
Balance on hand..	\$700

Notes Payable

1916	
Mar. 1 First Nat'l Bk. (90 days)...	\$300
Mar. 30 Less redeemed in Cash.....	300
	<hr/>
Bal. due on notes.....	\$000

This method gives the same information that is given in the correct ledger accounts, namely, that after paying \$300 to redeem the note, there is \$700 in cash still in the business; and there is nothing owing on simple promissory¹ notes. However, the work involved in the method just illustrated is the chief objection to its use. It involves an addition or subtraction after each entry, with as many

¹ A Mortgage payable is a promissory note secured by a mortgage. The liability is on the note rather than on the mortgage. They are shown in separate accounts for convenience.

opportunities for errors in the operations. Under the correct method of creating accounts, the deduction is expressed by placing the amount on the opposite side of the account. Immediately after making the correct entries for this transaction, the two accounts involved would appear as follows:

Cash

1916	1916
Mar. 1 On hand..... \$1,000	Mar. 30 Note payable redeemed... \$300

Notes Payable

1916	1916
Mar. 30 Cash paid to re- deem..... \$300	Mar. 1 First Nat'l Bk. (90 days)... \$300

In this illustration the only items entered as a result of this transaction are the credit to Cash and the debit to Notes Payable, the others having been made on March 1, at the time of opening the books.

No deductions are made on the face of the account. At the close of a month or year, or at some other special time the sum of the debit and the sum of the credit sides are found separately, and the difference between the two sums calculated in pencil to find the balance of the account.

An Account in Balance.—In the last illustration above, the Notes Payable account having a debit and credit of equal amounts is said to be in balance. The horizontal lines are used to indicate that fact.

No Subtractions in Accounts.—From the discussion of the accounts as brought out by this transaction, we can

formulate the principle that *subtractions are never made in ledger accounts in recording transactions*. The effect of subtraction is obtained by adding the amount in question to the opposite side of the account. For that reason we can recognize as correct, only the last form shown above for the ledger accounts of cash and notes payable. Instead of deducting the \$300 cash paid from the debit side of the account it is added to the credit side, to show that the amount of cash in the business has been decreased by that amount. This is a type of one of the very essential abbreviations used in bookkeeping.

Reasoning Out Debits and Credits.—Referring again to the transactions of Mr. Arnold for March 30, shown on page 14, there is seen to be one involving the payment of interest. The \$6 paid for the use of money, commonly called interest, is placed on the credit side of Cash account because it decreases the cash of the business. It does not reduce the amount of any account showing a liability of the business to outside parties, nor is it disbursed in exchange for some other form of property. It is a plain case of a disbursement of cash that results in a decrease of the capital of the business. Therefore, the other account affected by this transaction is Mr. Arnold's capital account. On which side of the capital account will this \$6 be placed? We might say that since every transaction requires equal amounts to be placed on the debit and credit sides of the ledger, and since Cash account is credited in this case, then obviously the other account involved should be debited. This is good logic and leads to the correct entry, but we should always be able to find a reason for such an entry from another point of view. In this case, we debit Mr. Arnold's Capital account with the \$6 because, as previously stated, it is an item that reduces his capital. If it reduces his capital it is the function of bookkeeping to show his capital reduced in the ledger.

His capital can be reduced in the ledger only by placing the item on the left hand or debit side of the Capital account.

After making the complete entry for this \$6 payment of interest, Mr. Arnold's Capital account would appear as shown in Illustration 5 on page 20, with only two amounts in it, one debit and one credit. Cash account would have three amounts entered up to this time, one debit and two credits. The Capital account would have \$4000 on the credit side entered at the time the ledger was opened, and \$6 on the debit side. The Cash account would have \$1000 on the debit side, the amount of cash in the business March 1; and two items on the credit side, \$300 and \$6 respectively.

On March 31, Mr. Arnold's narrative of events as stated on page 12 shows two transactions. He pays \$30 for labor, and \$20 for general expenses. These two classes of disbursement are usually considered as decreasing capital rather than changing its form, hence they require debits to Mr. Arnold's Capital account. Cash account is credited for the \$30 and \$20 payments, because cash is decreased in amount as a result of the payments.

Another type of transaction that requires analysis at this time is the one recorded under date of April 16, on page 14. It states that Mr. Arnold received a \$40 check for milk sold to the creamery. This is regarded as an increase in the capital of Mr. Arnold, and is accordingly entered on the credit side of his Capital account. The production and sale of milk has caused Mr. Arnold to possess more wealth. Consequently, his Capital account is credited to show the addition of \$40 to his wealth. Cash account is debited with the \$40 because the amount of cash in the business has been increased. A check is considered as cash in bookkeeping.

We might proceed to take up each of the other trans-

actions on pages 14 and 15, for discussion with a view to finding the reason for interpreting them in the ledger accounts as they are illustrated on pages 20-22. However, the ones already discussed illustrate all the principles involved. With the exception of the \$700 mortgage paid off on December 10th, all the remaining transactions involve either an increase in cash with a resulting increase of the Capital account, or a decrease in cash with a corresponding decrease in the Capital account.

Interpretation of Accounts.—From an examination of Mr. Arnold's Capital account as shown on page 20, we see that it shows \$4000 net capital invested on Mar. 1, 1916. During the year it shows several additions to capital on the right side, aggregating \$2000, and several deductions from capital on the left side, aggregating \$1000. By a purely arithmetical process, then, we find that the capital at Mar. 1, 1917, is \$5000 as shown by the account, or \$1000 more than it was on Mar. 1, 1916.

This increase of \$1000 in net capital does not take the form of an increase in property, for all the property accounts (Cash, Mr. Bell; Horses, Cattle and Equipment) show the same amounts on hand Mar. 1, 1917, as on Mar. 1, 1916. It is represented by a decrease in liabilities. Mortgage Payable and Notes Payable have decreased during the year \$700 and \$300 respectively, a total of \$1000.

Since Mr. Arnold has just as much property on Mar. 1, 1917, as he had on Mar. 1, 1916, but owes \$1000 less to other people, it is quite apparent that he is \$1000 better off. This condition is reflected in his Capital account. We find, then, that this account fulfils the requirements of an account as previously defined, in that it is "an exhibit of the bookkeeping effects resulting from transactions involving a particular thing." The particular thing in this case is Mr. Arnold's capital.

Likewise, Cash, Horses and other accounts exhibit the

bookkeeping effects resulting from transactions involving cash, horses, etc., respectively.

Debit and Credit Balances.—Before using the results of the ledger accounts it is necessary to find the balance of each one.

The balance of an account is the difference between the sum of the debits and the sum of the credits. If the sum of the debits is greater than the sum of the credits, the account is said to have a debit balance. If the sum of the credits is greater than the sum of the debits, the account is said to have a credit balance. If the sum of the two sides is equal, the account is in balance.

Thus, on pages 20-22, Cash, Mr. Bell, Horses, Cattle and Equipment accounts have debit balances; Mr. Arnold's Capital account has a credit balance, and Mortgages Payable and Notes Payable accounts are in balance.

From a knowledge of the nature of resources, compared with the observation just made concerning balances of accounts, one can see that, in this case, all accounts representing resources have debit balances, and those representing liabilities (including liability to the proprietor) have credit balances. When accounts are in balance they do not represent either resources or liabilities. It can be stated as a rule, that *all resources are represented by debit balances in ledger accounts, but it is pointed out later that all debit balances are not resources. Likewise all liabilities are represented by credit balances in ledger accounts, but all credit balances are not liabilities.* Up to the present time, however, all accounts considered have represented either resources or liabilities, including the Capital account.

Statements Prepared from Ledger Accounts.—From those ledger accounts, then, we are able to prepare a Statement of Resources and Liabilities, and a Loss and Gain Statement, as in Illustrations 6 and 7 respectively.

It will be seen that the Statement of Resources and Liabilities is the same as the one that was assumed as being prepared from Mr. Arnold's books in the discussion of the reason for keeping a record of business transactions. (See Illustration 3.)

ILLUSTRATION 6

STATEMENT OF RESOURCES AND LIABILITIES PREPARED FROM
LEDGER ACCOUNTS FEB. 28, 1917—MR. ARNOLD

<i>Resources</i>	<i>Liabilities</i>
Cash.....\$1,000.00	To outsiders (none)
Owing by Mr. Bell.. 500.00	Arnold's Capital.....\$5,000.00
Horses..... 1,600.00	
Cattle..... 1,100.00	
Equipment..... 800.00	
<u>\$5,000.00</u>	<u>\$5,000.00</u>
<u><u> </u></u>	<u><u> </u></u>

Recalling that Arnold had \$1000 in cash at the beginning of the year (see Illustration 2), the question arises now, as it did then, "How can Mr. Arnold pay off \$1000 that he owes and still have the same amount of cash at the close of the year as he did at the beginning?" The answer is, that he did change his cash balance several times during the year, but that the increase in cash from sale of products was just enough to offset the decrease due to payments for expenses, mortgage and note.

Likewise, Mr. Arnold changed his capital several times during the year, but the net result only is shown in the Statement of Resources and Liabilities.

One must look to the Loss and Gain Statement of Illustration 7 to find out more about the changes in capital and the reasons therefor.

ILLUSTRATION 7

LOSS AND GAIN STATEMENT PREPARED FROM ANALYSIS OF CAPITAL
ACCOUNT FOR THE YEAR ENDING FEB. 28, 1917—MR. ARNOLD

<i>Expense and Losses</i>		<i>Incomes and Gains</i>	
Rent.....	\$400.00	Milk sold.....	\$300.00
Labor.....	300.00	Corn sold.....	1,200.00
General expenses....	300.00	Oats sold.....	400.00
Balance, gain for year	1,000.00	Miscellaneous Inc....	100.00
	<hr/>		<hr/>
	\$2,000.00		\$2,000.00
	<hr/>		<hr/>

This statement shows that Mr. Arnold made a net gain of \$1000 during the year. Accordingly his capital is \$1000 greater than at the beginning of the year. It has been seen that his cash balance is exactly the same as at the beginning of the year. These facts lead to a very important conclusion, namely, *a gain during a year does not necessarily mean an increase of cash on hand at the close of the year; a loss during a year does not necessarily mean a decrease of cash on hand at the close of the year.*

The question probably arises as to how we get the figures shown in the Loss and Gain Statement above. These are obtained from an analysis of Mr. Arnold's Capital account of Illustration 5. The items on the left side of the Loss and Gain Statement, with the exception of the \$1000 balance, are obtained from the left side of the account. They represent decreases in capital. The items on the right side of the statement are obtained from the right side of the account. They represent increases in capital. For example, the \$300 for milk sold as shown in the statement is obtained from the sum of the items on the right side of the Capital account, labeled "milk."

The sum of the items on the right side of the statement is \$2000, representing gross income or gross increase in

capital during the year. The sum of the first three items on the left side of the statement is \$1000, representing expenses or decreases in capital during the year. The balance, then, shows the net income, net profit or net gain and represents the net increase in capital during the year. This increase is verified by referring to Arnold's capital account which shows \$4000 capital March 1, 1916, and \$5000 on March 1,¹ 1917, an increase of \$1000.

ILLUSTRATIVE PROBLEMS

1. Mr. Allen has property valued at \$5000 in cash, horses, cattle and equipment at the beginning of the year. He owes \$1000 on a note at that time. At the close of the year his Cash, Horses, Cattle and Equipment accounts show exactly the same balances as at the beginning, but his note payable account is closed.

(a) What was the balance of his Capital account at the beginning of the year?

(b) At the close of the year?

(c) What was his net gain during the year?

(d) If a gain results in an increase in capital, why do the property accounts not show an increase in value at the close of the year?

2. Using ordinary ledger paper, create accounts and the debits and credits necessary therein to interpret the following transactions in accordance with the bookkeeping abbreviations and principles learned up to the present time:

March 1, 1916, George Woods starts keeping his accounts in a systematic way and accordingly values his possessions as follows: Cash \$600, owing by Thos. Carey \$100, cattle \$800, poultry \$200, swine \$900, horses \$1200, equipment \$600, land \$8000, buildings \$5500. He owes \$8000 on a mortgage note.

¹ March 1 and February 28 are used interchangeably as occasion requires. The statements are prepared after all transactions are entered February 28, and before any are entered on March 1.

April 1, Paid cash for labor \$25.

May 1, Paid \$240 for six months' interest on mortgage.

May 6, Received \$100 from Thos. Carey in settlement of his account.

May 7, Sold eggs for \$5 cash.

May 8, Paid cash for labor \$25.

June 1, Paid cash for labor \$25.

June 8, Paid for General Expense items \$15.

June 10, Sold some fruit for cash \$10.

July 1, Sold some hay for \$180 cash.

July 3, Paid cash for labor \$45.

July 6, Paid \$85 for some new equipment.

July 21, Paid for General Expense items \$25.

Aug. 4, Paid cash for labor \$60.

Aug. 28, Received \$500 cash for oats.

Sept. 1, Paid cash for labor \$50.

Sept. 6, Received \$25 from sale of fruit and vegetables.

Sept. 20, Sold cabbage for \$400 cash.

Oct. 1, Paid cash for labor \$25.

Nov. 1, Paid cash for labor \$25.

Nov. 1, Paid for General Expense items \$30.

Nov. 1, Sold all the swine for \$900.

Nov. 1, Paid \$240 for six months' interest on mortgage loan.

Nov. 1, Paid \$1800 as part payment on mortgage note.

Nov. 28, Sold some corn for \$700 cash.

Dec. 1, Paid cash for labor \$30.

Jan. 3, 1917, Paid for General Expense items \$35.

Feb. 15, Paid for taxes \$80.

Feb. 21, Paid for fire insurance¹ premiums \$20.

3. From the ledger accounts created in problem 2 above, prepare a Statement of Resources and Liabilities, as of February 28, 1917; and a Loss and Gain Statement for the year ended February 28, 1917.

¹ When a premium is paid on a fire insurance policy, only the amount of the premium enters into the accounts. The face of the policy, the amount collectible in case of fire, does not affect the accounts until a loss occurs. For such a transaction see "Fire Loss," Chapter VII.

Note to Instructor.—Problems 2 and 3 above should be preserved and returned to students after they have worked problems 1 and 2 at close of Chapter III. (See (e) Illustrative Problem 2, Chapter III.)

4. Using ledger paper create accounts and the debits and credits necessary to interpret the following transactions in accordance with the bookkeeping abbreviations and principles learned up to the present time:

March 1, 1916, Harry Mansfield began farming operations with investment as follows: Cash at the farm \$30, cash in bank \$1320, 2 horses \$400, 3 head of cattle \$120, equipment \$230. He owes his father, E. A. Mansfield, \$700 on a promissory note.

May 20, Drew \$50 out of the bank.

May 28, Paid \$35 for labor.

May 31, Paid \$16 for General Expense items.

June 18, Sold fruit for \$10 cash.

June 30, Sold some hay for \$160 cash.

July 19, Paid \$300 for 2 horses.

July 31, Paid \$80 for new equipment.

Aug. 16, Paid \$60 for labor.

Aug. 31, Paid \$70 for General Expense items.

Sept. 1, Paid \$21 interest on note.

Sept. 1, Paid father \$300 on the note, which payment was endorsed on the back of the note.

Oct. 1, Sold oats to J. M. Drew on account \$350.

Oct. 3, Paid \$70 for labor.

Nov. 19, Received \$40 from sale of garden truck

Dec. 18, Paid \$50 for General Expense items.

Jan. 20, 1917, Sold all the cattle for \$175.

Feb. 18, Sold all the corn crop left for \$250.

Feb. 20, Received \$200 from J. M. Drew on account.

Feb. 20, Paid taxes \$35.

Feb. 25, Paid \$40 for labor.

Feb. 26, Paid \$35 for General Expense items.

Feb. 28, Paid father \$300 on the note, taking up the old note and giving a new one for the balance of the principal now due.

5. From the ledger accounts created in problem 4 above, prepare a Statement of Resources and Liabilities, as of February

28, 1917; and a Loss and Gain Statement for the year ended February 28, 1917.

REVIEW QUESTIONS

1. Name three methods, anyone of which might be used in recording business transactions during a period of time.
2. Which one of these methods is used more in practice? Which one is unscientific? Why?
3. Why is it considered advisable to learn the direct ledger account method?
4. How is bookkeeping assisted by the use of abbreviations? Why is it necessary to know and understand the abbreviations used in bookkeeping?
5. Define business transaction; value; property.
6. What is capital? Distinguish between accounts of property and the proprietor's capital account.
7. What is an account? What information should be shown in an account? What is another title for the left-hand side of an account? The right-hand side?
8. What is a ledger? Illustrate the form of a ledger page.
9. In opening a double entry set of books, what entry is made in the proprietor's capital account? Any resources owned at the time of opening the books are shown on the books in what way? How are liabilities shown at the time of opening the books?
10. What is true concerning the sum of the debits and credits resulting from any bookkeeping transaction?
11. Why does a payment of \$300 to redeem a note require a credit to cash account?—a debit to notes payable account?
12. When \$300 cash is paid why is it not recorded in the cash account as a deduction from the debit side **instead** of an addition to the credit side?
13. What is the difference between a note payable and a mortgage payable account?
14. When \$6 is paid for the use of money, why is Cash account credited? Why is the proprietor's capital account debited?

15. Why is a \$30 payment for labor expressed in the ledger as a credit to cash and a debit to the capital account?
16. When Mr. Arnold receives cash for the sale of milk, why does he debit cash and credit his capital account?
17. How is a decrease of capital shown in Mr. Arnold's capital account?
18. If all the property accounts, liability accounts and proprietor's capital account have exactly the same balance at the close of the year as at the beginning, does it mean that no changes have taken place during the year in any of the accounts? Discuss.
19. When does an account have a debit balance? A credit balance? When is it in balance?
20. If changes in capital have taken place during the year what financial statement shows the changes?
21. Does a loss during a given year necessarily mean that there is less cash in the business at the close than at the beginning of the year? Why? Does a gain mean there is more cash in the business? Why?
22. How were the figures obtained for the Loss and Gain Statement in Illustration 7?
23. What is the relation existing between a Statement of Resources and Liabilities as of February 28, 1917, and a Loss and Gain Statement of the same business for the year ending February 28, 1917?
24. Study the transactions in connection with Illustration 5, and state the reason for each debit and credit recorded. Give reasons for a decrease or increase in capital as the transactions seem to indicate when recorded in Illustration 5.

CHAPTER III

SUBDIVISION OF CAPITAL ACCOUNT

Reason for Subdividing Capital Account.—It has been shown up to the present time how to “keep books” consisting of only one book, the ledger, with accounts only for each of the several classes of Resources and Liabilities, including the Proprietor’s Capital account. Under that method the transactions of any business operated by a single proprietor can be recorded, and statements of Resources and Liabilities and Loss and Gain can be prepared. If the transactions causing an increase or decrease in capital are very numerous, the preparation of a Loss and Gain Statement is rather tedious, for it requires considerable work in analyzing the capital account of the proprietor. It is principally for that reason that another method of showing increases and decreases in capital is much more common. It is based on the principle that an account which requires much analysis in order to present data in a usable manner should not be created in that way. In order to avoid such analysis, separate accounts are used. For example, under this latter method, an increase in capital due to the sale of corn is credited to Corn account rather than to the Proprietor’s Capital account; a sale of oats is credited to Oats account; and expense for labor is debited to Labor account rather than Capital account.

In this way the total income from corn can be found very easily from the Corn account without the necessity of picking out “corn” items from the Capital account. The total expense for labor can be found directly from the

ILLUSTRATION 8

PROPRIETOR'S CAPITAL ACCOUNT SHOWING DAILY INCREASES AND DECREASES

DEBIT	Mr. Arnold's Capital	CREDIT	
1916		1916	
Mar. 30 General (Int.)....	\$6	Mar. 1 Capital invest- ed.....	\$4,000
Mar. 31 Hired man's labor	30	Apr. 16 Milk.....	40
Mar. 31 General expense..	20	May 16 Milk.....	60
Apr. 16 General (Ins. & taxes).....	60	June 16 Milk.....	65
Apr. 30 Hired man's labor	30	June 28 Fruit and gar- den truck....	20
May 20 General expense..	10	July 16 Milk.....	50
May 31 Hired man's labor	30	Aug. 16 Milk.....	20
June 30 Hired man's labor	30	Aug. 18 Oats.....	400
July 31 Hired man's labor	60	Sept. 16 Milk.....	25
Aug. 31 Hired man's labor	30	Oct. 7 Garden truck and fruit.....	60
Sept. 10 General expense..	25	Oct. 16 Milk.....	25
Sept. 16 General expense..	40	Nov. 16 Milk.....	15
Sept. 30 Hired man's labor	30	Nov. 18 Garden Truck..	20
Oct. 31 Hired man's labor	30	Dec. 6 Corn.....	1,200
Oct. 31 General expense..	25		
Nov. 30 Hired man's labor	30		
Dec. 10 General (Int.)....	42		
Dec. 20 General expense..	32		
1917			
Jan. 31 General expense..	20		
Feb. 20 General expense..	20		
Feb. 21 Rent for year....	400		
Feb. 28 Bal. down, Net capital.....	5000		
	<u>\$6000</u>		<u>\$6000</u>
		1917	
		Mar. 1 Balance brought down.....	\$5000

Labor account. In fact, the Loss and Gain Statement can be prepared from the results obtained from the various accounts showing expense and income.

A Comparison of the Two Methods.—A comparative study of the two methods of treating transactions that cause increases or decreases in capital tends to show the advantages or disadvantages of each. For this purpose, the transactions of Mr. Arnold are used as stated in narrative form on pages 14 and 15. Since this different method of recording increases and decreases in capital does not change, in any material way, the other accounts as Cash, Horses, etc., of Illustration 5, they are not reproduced here.

The Capital account of Mr. Arnold is reproduced here exactly as shown in Illustration 5 to assist in the comparison.

When all increases and decreases of capital are entered directly into the Capital account as in Illustration 5, the account appears as in Illustration 8.

Expense and Income Accounts.—When increases and decreases in capital are recorded in the appropriately named accounts of income and expense, the group of accounts presented in Illustration 9 is required to take the place of Mr. Arnold's Capital account as shown in Illustration 8.

ILLUSTRATION 9

EXPENSE AND INCOME ACCOUNTS AND CAPITAL ACCOUNT

Mr. Arnold's Capital

<hr/>	
	1916
	Mar. 1 Capital invested..... \$4000
	<i>Rent</i>
<hr/>	
1917	
Feb. 21 Cash.....	\$400

Labor

1916	
Mar. 31 Cash.....	\$30
Apr. 30 "	30
May 31 "	30
June 30 "	30
July 31 "	60
Aug. 31 "	30
Sept. 30 "	30
Oct. 31 "	30
Nov. 30 "	30

General Expense

1916	
Mar. 30 Cash (Int.)	\$6
Mar. 31 "	20
Apr. 16 " (Ins. and taxes)	60
May 20 Cash	10
Sept. 10 "	25
Sept. 16 "	40
Oct. 31 "	25
Dec. 10 "	42
Dec. 20 "	32
1917	
Jan. 31 "	20
Feb. 20 "	20

Milk

1916	
Apr. 16 Cash	\$40
May 16 "	60
June 16 "	65
July 16 "	50
Aug. 16 "	20
Sept. 16 "	25
Oct. 16 "	25
Nov. 16 "	15

FARM ACCOUNTING

Corn

	1916	
	Dec. 6 Cash.....	\$1200

Oats

	1916	
	Aug. 18 Cash.....	\$400

Miscellaneous Income

	1916	
	June 28 Cash (Fruit & Garden truck)	20
	Oct. 7 Cash (Fruit & Garden truck)	60
	Nov. 18 Cash (Fruit & Garden truck)	20

The expense and income accounts of Illustration 9, such as Rent, Labor, General Expense, and others are intended to record transactions showing decreases and increases of capital. Those items showing increases are placed on the credit side and those showing decreases of capital are placed on the debit side of the ledger, but are placed under some other heading than Capital account. For example, the \$400 on the debit side of Rent account in Illustration 9 is the same item that appears in Illustration 8 on the debit side of Mr. Arnold's Capital account, dated Feb. 21.

Both items were created as a result of the same transaction but under different methods of accounting. The debit to the Capital account was made under the method that shows all increases and decreases in the capital of the business direct in the Capital Account. The debit to Rent account was made under the method that shows increases

and decreases of capital under various appropriate heads named so as to show the reason for such increases and decreases. The transaction under discussion is the one shown on page 14, in which Mr. Arnold paid \$400 on Feb. 21 for the year's rent. Under the first method, that of showing increases and decreases of capital direct in the Capital account, the entry made is a debit to Mr. Arnold's Capital account and a credit to Cash account. Under the second method, that of showing increases and decreases of capital temporarily in other accounts appropriately named, the entry made is a debit to Rent account and a credit to Cash account.

Similarly, under the second method of recording increases and decreases of capital, when \$30 is paid for labor on March 31, the entry is a debit to Labor account and a credit to Cash account. When garden truck is sold for \$20 cash, the Cash account is debited and Miscellaneous Income account credited. An account called Garden Truck can be kept if desired. In this way, all of the items in the several accounts of Illustration 9 might be traced from the transactions stated on pages 14 and 15.

Nominal Accounts.—It is customary in business practice to use the several specially named accounts for recording increases and decreases in capital. *Those accounts showing increases in capital are called income accounts; those showing decreases in capital are called expense accounts. All expense and income accounts are known as nominal accounts.* They bear this title largely because of the fact that they are only temporary accounts, while the resource, liability and Capital accounts are more or less permanent. The nominal accounts are said to be temporary, and at the same time merely subdivisions of the Proprietor's Capital account because they show the nature of increases and decreases in capital only for a brief period of time. At regular intervals, the results of the several nominal accounts

are assembled in one place. From this place the net result of all increases and decreases in capital is determined, and such result is shown in a single amount in the Proprietor's Capital account.

Loss and Gain Account.—These several accounts, taking the place of the one Proprietor's Capital account, enable us to find more easily the expenses and incomes of various sorts, but they do not as yet enable us to determine what the net increase or decrease in capital is, or what the capital is at the present time. In order to find these, it is necessary to perform another step in the correlation of the accounts just presented. It is necessary to bring the results of the accounts of expense and income into the Capital account. This is accomplished through the medium of a Loss and Gain account. After this process is performed the accounts should appear as in Illustration 10.

ILLUSTRATION 10

NOMINAL ACCOUNTS CLOSED INTO CAPITAL THROUGH LOSS AND GAIN ACCOUNT

Mr. Arnold's Capital

1917	1916
Feb. 28 Balance down. . \$5,000	Mar. 1 Capital invested \$4,000
	1917
	Feb. 28 From loss and
	gain..... 1,000
<u>\$5,000</u>	<u>\$5,000</u>
	1917
	Mar. 1 Balance, net
	capital..... \$5,000

Rent

1917		1917	
Feb. 21 Cash.....	\$400	Feb. 28 To loss & gain	\$400
	<u> </u>		<u> </u>

Labor

1916		1917	
Mar. 31 Cash.....	\$30	Feb. 28 To Loss & Gain	\$300
Apr. 30 "	30		
May 31 "	30		
June 30 "	30		
July 31 "	60		
Aug. 31 "	30		
Sept. 30 "	30		
Oct. 31 "	30		
Nov. 30 "	30		
	<u> </u>		<u> </u>
	\$300		\$300
	<u> </u>		<u> </u>

General Expense

1916		1917	
Mar. 30 Cash (Interest).	\$6	Feb. 28 To Loss & Gain	\$300
Mar. 31 "	20		
Apr. 16 " (Ins. & Taxes)*.....	60		
May 20 Cash.....	10		
Sept. 10 "	25		
Sept. 16 "	40		
Oct. 31 "	25		
Dec. 10 " (Interest).	42		
Dec. 20 "	32		
1917			
Jan. 31 "	20		
Feb. 20 "	20		
	<u> </u>		<u> </u>
	\$300		\$300
	<u> </u>		<u> </u>

FARM ACCOUNTING

Corn

1917	1916
Feb. 28 To Loss & Gain <u>\$1,200</u>	Dec. 6 Cash..... <u>\$1,200</u>

Oats

1917	1916
Feb. 28 To Loss & Gain <u>\$400</u>	Aug. 18 Cash..... <u>\$400</u>

Milk

1917	1916
Feb. 28 To Loss & Gain <u>\$300</u>	Apr. 16 Cash..... <u>\$40</u>
	May 16 " 60
	June 16 " 65
	July 16 " 50
	Aug. 16 " 20
	Sept. 16 " 25
	Oct. 16 " 25
	Nov. 16 " 15
<u>\$300</u>	<u>\$300</u>

Miscellaneous Income

1917	1916
Feb. 28 To Loss & Gain. <u>\$100</u>	June 28 Cash (Fruit & Garden truck) <u>\$20</u>
	Oct. 7 Cash (Fruit & Garden truck) 60
	Nov. 18 Cash (Fruit & Garden truck) 20
<u>\$100</u>	<u>\$100</u>

Loss and Gain

1917		1917	
Feb. 28 From Rent....	\$400	Feb. 28 From Milk....	\$300
Feb. 28 From Labor...	300	Feb. 28 From Corn....	1,200
Feb. 28 From General		Feb. 28 From Oats....	400
expense.....	300	Feb. 28 From Misc. In-	
Feb. 28 To Arnold's Cap.		come.....	100
a/c Net Gain	1,000		
	<u>\$2,000</u>		<u>\$2,000</u>

The Loss and Gain account is created temporarily in the ledger at the close of a year or other fiscal period, as a summary account, into which is brought the aggregate results of each of the other accounts that show expenses or incomes. It should not be confused with the Loss and Gain statement, as the latter is not a ledger account, but is a supplementary analysis of some of the facts shown in the ledger. It is true that in its simplest form, as already illustrated, the Loss and Gain Statement looks very much like a Loss and Gain account, but in a more elaborate and elucidating form its similarity to the account is less noticeable. In the exercise at hand, the Loss and Gain statement would be merely a copy of the Loss and Gain account.

The Loss and Gain account, then, is a sort of place for the bringing together of figures which affect the loss or gain of a business. From it may be seen in one account, the last one in Illustration 10, that the expense for rent is \$400, for labor \$300, for general expense \$300, and that the income from milk is \$300, from corn \$1200, from oats \$400, and from miscellaneous items \$100. In order to find the resulting net gain or loss from these several items it is necessary to bring them together and perform certain

processes of addition and subtraction. One not acquainted with bookkeeping methods might think it necessary to perform this brief calculation on a separate piece of paper, but bookkeeping principles and abbreviations provide for a more systematic and permanent method.

The expense for rent is removed from the debit side of Rent account and placed on the debit side of Loss and Gain account, where it can be used in connection with other expenses and other incomes transferred to the latter account for the purpose of finding the net result. After the net result of all nominal accounts is found in Loss and Gain account it is removed from that account and placed in Capital account.

Transfer or Closing Entries.—The method of removing or transferring these balances from one account to another involves bookkeeping abbreviations that require further study and analysis. It involves closing entries. *Closing entries are those made to transfer expenses and incomes from their several accounts into the capital account of the proprietor.* Consider first the transfer of the \$400 rent from the debit side of Rent account, to the debit side of Loss and Gain account, as in Illustration 10. Before the transfer, the Loss and Gain account did not contain any entries, while the Rent account appeared as follows:

<i>Rent</i>	
1917	
Feb. 21 Cash.....	\$400

In order to transfer this amount from Rent account to the Loss and Gain account, one might choose the way most natural to the person not accustomed to bookkeeping methods. This natural but wrong method would consist in drawing a line through the entry under Rent account and

writing the entry under Loss and Gain account, in this way:

Rent

1917	
Feb. 21 Cash.....	\$400

Loss and Gain

1917	
Feb. 28 Cash for rent..	\$400

This process would give the result sought, namely, the elimination of the \$400 balance in Rent account, and its transfer to the same (debit) side of Loss and Gain account. Bookkeeping principles, however, will not permit the transfer to be made in the way just indicated. In fact, it might be stated as a principle of bookkeeping, that *an item or balance in an account should never be crossed out preparatory to its transfer to some other account. In order to transfer an item or group of items from the debit side of one account to the debit side of another, credit the account from which the amount is transferred and debit the account to which it is transferred.* Thus, in the case of Rent account under discussion, the correct transfer would cause the accounts to appear as in Illustration 11.

ILLUSTRATION 11

CLOSING RENT ACCOUNT INTO LOSS AND GAIN ACCOUNT

Rent

1917	
Feb. 21 Cash.....	\$400

1917	
Feb. 28 To Loss & Gain	\$400

Loss and Gain

1917

Feb. 28 From Rent.... \$400

This conforms to the principle that a debit and credit of equal amounts should be made for every transaction. It gives the results that were wanted, namely, the elimination of the \$400 from the debit side of Rent account and its transfer to the debit side of Loss and Gain account. It is the principle that should always be followed in transferring an item or group of items from one account to another. In Illustration 11, it is seen that there is an item of \$400 on the debit side of Rent account and one of \$400 on the credit side. The account is therefore in balance. The double lines ruled under the amount on each side indicate this fact, and also indicate that any items subsequently placed under Rent account are not to be mingled in any way with any of the figures above the double lines.

Similarly the transfer of the total milk income from the Milk account of Illustration 10 to the Loss and Gain account is effected by making a debit entry in Milk account, and a credit entry in Loss and Gain account for the amount of the total income from milk for the period of time in question, one year. *In order to transfer an item or group of items from the credit side of one account to the credit side of another, debit the account from which the amount is transferred and credit the account to which it is transferred.*

From a careful observation of the accounts of Illustration 10, it can be seen that the debits to Rent, Labor and General Expense accounts are tabulated under appropriate titles during the year; but at the close of the year they are transferred each in total to the debit of Loss and Gain account. Likewise, the totals of Milk, Corn, Oats and Mis-

cellaneous Income respectively are transferred at the close of the year to the credit of Loss and Gain account. The result of these transfers is that the accounts in which the various expenses and incomes are tabulated during the year are closed and ruled off at the close of the year, while the Loss and Gain account is created. This newly created Loss and Gain account contains the essential financial information of all the accounts closed into it. It shows the total expense for rent, labor and general items. It shows the total income from milk, corn, oats and miscellaneous sources. Any details concerning these expenses or incomes can be found by reference to the several accounts closed. The essential financial information is the total expense and income of each class.

By bringing these figures together the net gain is easily determined, since it is found by subtracting the total expenses from the total income. In the account under immediate discussion, the Loss and Gain account of Illustration 10, the total income is \$2000, while the total expenses amount to \$1000, the latter being the sum of the first three debit items of the account.

Closing Loss and Gain into Proprietor's Capital.—The Loss and Gain account has been defined as an account created temporarily at the close of a year to serve as a summary for expenses and incomes. Its temporary nature is quite evident when it is learned that Mr. Arnold's Loss and Gain account is closed into Mr. Arnold's Capital account almost as soon as it has received all its entries from other accounts. The closing of the Loss and Gain account brings up a point that was not raised in connection with the closing of the several expense and income accounts. In their cases any specific account had entries on only one side, at the time of closing it. In the Loss and Gain account there are entries on both the debit and credit sides. However, only one entry is made in the Loss and Gain account to

close it. In this specific instance, the credits exceed the debits by \$1000, so it is necessary to transfer \$1000 to the credit side of Mr. Arnold's Capital account. It is not required that the total debits should be transferred to the debit side and the total credits to the credit side of Mr. Arnold's Capital account. A transfer of the difference between the debits and credits closes the Loss and Gain account just as effectively and shows the net results in a more concentrated form in Mr. Arnold's account. In the case at hand the result is a net gain. If the result had been a net loss, the debits in the Loss and Gain account would have exceeded the credits before closing. The entry transferring the loss would then have been a credit to Loss and Gain and a debit to Arnold's Capital account.

After closing the nominal accounts into Capital account through Loss and Gain account any balances remaining in the ledger are balances of accounts representing resources and liabilities. A statement of resources and liabilities, then, can be prepared quite easily from the balances remaining in the ledger after closing the expense and income accounts.

Comparison of Results.—From a study of Mr. Arnold's Capital account as it appears in Illustration 8, when each expense and income was entered on the debit and credit sides respectively as they occurred; and from a further study of it in Illustration 10 when only one entry was made in his account at the close of the year for the amount of the net gain, one may draw some conclusions concerning the results. In brief, the result is the same. Mr. Arnold's Capital account under the first method shows a balance brought down on March 1, 1917, of \$5000, which is the same balance brought down under the second method.

Continuing the comparison of Mr. Arnold's Capital accounts as reflected in Illustrations 8 and 10, it is seen in each case that there is a credit entry of \$4000 represent-

ing his capital on March 1, 1916. Except for the balances at the beginning and at the close of the year, the two capital accounts in question do not have any other figures in common. The one in Illustration 10 has an entry of \$1000 on the credit side under date of February 28, 1917. This entry takes the place of all the entries made during the year, as shown in detail in Illustration 8. In other words, using Illustration 8, the sum of all the credit entries, except the opening balance of \$4000, minus the sum of all the debit entries, representing decreases in capital, gives \$1000 as a result. Under this method all increases and decreases in capital are recorded in the Capital account. Under the method used in Illustration 10, all increases and decreases in capital are recorded in specially named accounts to indicate the nature of the income or expense. Then the results of these accounts are transferred to the Capital account through the Loss and Gain account, so that only the net increase in capital is entered in Mr. Arnold's Capital account.

This latter method is the one which will be followed more often in practice and in subsequent problems, exercises and discussions in this book. It gives an opportunity for analyzing the transactions more fully in the ledger as the transactions occur, and also reduces the number of entries in the Capital account. On the other hand, when the Capital account receives an entry for increase or decrease of capital, only at the close of the year one cannot find the net capital of the business as easily at any time as he can under the other method. This, however, is a very minor objection to the method, for one seldom has occasion to find the net capital of the business at any time except the close of a fiscal year, while he does have occasion from time to time to find the expenses or incomes of various classes.

Balance Brought Down.—A point of bookkeeping form

which should be noted carefully is represented in the carrying down of the balance of Mr. Arnold's Capital account, in both Illustrations 8 and 10. It will be observed that there is a debit entry of \$5000, "balance down," on the last line before the total of the debits is recorded. The credit of \$5000 to offset this is on the credit side of the same account, below the double lines. Thus, the equilibrium of debits and credits is maintained. These entries do not change the condition of Mr. Arnold's Capital account. They merely cause the net capital to be shown by a single amount for the purpose of beginning a new year. The net capital would still be \$5000 without performing the operations of addition, drawing single and double lines and the making of a debit and credit of \$5000 as described above. If these bookkeeping operations or abbreviations are not employed, however, it is necessary to add and subtract several amounts from time to time in order to find the net capital. The double lines indicate that everything is in balance above them. The \$5000 brought down on the credit side below the lines indicates that it is the net result of all the amounts above the double lines.

Classification of Accounts.—In the course of the comparison of results discussed in the last several pages it was stated, "under the method used in Illustration 10, that all increases and decreases in capital are recorded in specially named accounts to indicate the nature of the income or expense." These "specially named accounts" are closed into Loss and Gain account, and the latter into Capital account at the close of the year. As previously stated, all the accounts so closed directly or indirectly into Capital account are known as nominal accounts. They are accounts named to represent an increase or decrease of a specific nature in the capital of the business. They do not represent accounts of resources or liabilities. Nominal accounts

are often called loss and gain accounts, since practically every nominal account results in a loss or gain.

There are two generally recognized classifications of accounts, the first of which is based upon the nature of the subject matter of the transaction, and the second upon the ultimate use of the balance of the account in the financial statements.

CLASSIFICATION 1

BASED ON THE SUBJECT MATTER

- A. Personal
- B. Impersonal
 - 1. Real
 - 2. Nominal

CLASSIFICATION 2

BASED ON THE ULTIMATE USE OF THE ACCOUNT BALANCES

- A. Balance Sheet
 - 1. Resources
 - 2. Liabilities
- B. Loss and Gain
 - 1. Expense
 - 2. Income

In either case, the principal use of the classification is to make easier the rules governing debits and credits and the treatment of account balances. In general a rule which applies to one account will apply to all others in its group. Accounts are usually arranged in the ledger in groups, as presented in the classification. That is, all resources together, all liabilities together, and so on.

Some principles have been developed in the preceding pages for debiting and crediting the various types of accounts shown in the two classifications. These principles will apply in a more or less modified form in the treatment of accounts in subsequent chapters.

Personal accounts record transactions with individuals,

firms or corporations. They may be considered as resources or liabilities, depending on the nature of the balance of the account.

A real account is one that records transactions relating to resources and liabilities other than personal accounts.

The other classes of accounts have been discussed in connection with the financial statements. The ledger accounts have been presented in accordance with Classification 2, above.

ILLUSTRATIVE PROBLEMS

1. Using ordinary ledger paper, create the necessary nominal and other accounts and express therein the debits and credits necessary to interpret the following transactions in the ledger of Mr. Woods. (Sufficient space is to be allowed for each account to permit of its use in problem 3, below.)

Mar. 1, 1916, Geo. Woods starts keeping his accounts in a systematic way, and accordingly values his possessions as follows: Cash \$600, owing by Thos. Carey \$100, cattle \$800, poultry \$200, swine \$900, horses \$1200, equipment \$600, land \$8000, buildings \$5500. He owes \$8000 on a mortgage note.

Apr. 1, Paid cash for labor \$25.

May 1, Paid \$240 for six months' interest on mortgage note.

May 6, Received \$100 from Thos. Carey in settlement of his account.

May 7, Sold eggs for \$5 cash.

May 8, Paid cash for labor \$25.

June 1, Paid cash for labor \$25.

June 8, Paid for miscellaneous items \$15.

June 10, Sold some fruit for cash \$10.

July 1, Sold some hay for \$180 cash.

July 3, Paid cash for labor \$45.

July 6, Paid \$85 for some new equipment.

July 21, Paid for miscellaneous items \$25.

Aug. 4, Paid cash for labor \$60.

Aug. 28, Received \$500 cash for oats.

Sept. 1, Paid cash for labor \$50.

Sept. 6, Received \$25 from sale of fruit and vegetables.
Sept. 20, Sold cabbage for \$400 cash.
Oct. 1, Paid cash for labor \$25.
Nov. 1, Paid cash for labor \$25.
Nov. 1, Paid for miscellaneous items \$30.
Nov. 1, Sold all the swine for \$900.
Nov. 1, Paid \$240 for six months' interest on mortgage note.
Nov. 1, Paid \$1800 as part payment on mortgage note.
Nov. 28, Sold some corn for \$700 cash.
Dec. 1, Paid cash for labor \$30.
Jan. 3, 1917, Paid for miscellaneous items \$35.
Feb. 15, Paid for taxes \$80.
Feb. 21, Paid for fire insurance premium \$20.

2. From the ledger accounts created in problem 1 above,
(a) Close the nominal accounts into Loss and Gain account.
(b) Close Loss and Gain account into Capital account.
(c) Bring down the balances of Capital and Cash accounts on March 1, 1917.

(d) Prepare a Statement of Resources and Liabilities as of February 28, 1917, and a Loss and Gain Statement for the year ended February 28, 1917, noting that the latter is practically a copy of the Loss and Gain account in such a simple case as this.

Note.—Closing an account or bringing down a balance always includes the drawing of the necessary single and double lines.

(e) Compare the ledger accounts and statements with the ones prepared for Illustrative Problems 2 and 3 of Chapter II. Be prepared to discuss orally any points of similarity or difference noted. (The instructor should lead a discussion of these points in class while students have all papers to examine.)

3. Using the same ledger as in problem 1 above, Mr. Woods continues his business for the second fiscal year beginning March 1, 1917.¹ You are asked to record the year's transactions which follow:

¹ The entries in the second year are made in the same accounts that were used in the first year, nominal accounts receiving their next entries on the first line below the double lines made in closing. Resource and Liability items are entered in the same way they would have been, had a new period not begun.

March 10, 1917, Paid cash for miscellaneous items \$16.

April 1, Paid cash for labor \$25.

May 1, Paid \$186 for six months' interest on mortgage note.

May 16, Sold eggs for cash \$8.

June 1, Paid cash for labor \$40.

June 25, Sold fruit and garden truck for \$17 cash.

July 2, Sold some hay for \$160 cash.

July 5, Bought a draft horse for \$200 cash.

Aug. 1, Paid \$45 for labor.

Aug. 26, Received \$600 cash for oats.

Sept. 1, Paid \$48 for labor.

Sept. 22, Received \$27 from the sale of fruit and vegetables.

Sept. 30, Sold cabbage to Theodore Wheat on account for \$520.

Note.—"On account" means that no cash passed hands. Accordingly Mr. Wheat is to be debited with the \$520. He will be credited when he pays.

Nov. 1, Paid cash for labor \$28.

Nov. 1, Paid \$186 for six months' interest on mortgage note.

Nov. 1, Paid \$500 as part payment on mortgage note.

Nov. 25, Received \$300 cash from Theodore Wheat to apply on his account.

Dec. 16, Sold some corn for \$530 in cash.

Dec. 17, Paid \$48 for labor.

Dec. 20, Bought some shotes for \$800 cash.

Jan. 6, 1918, Paid for miscellaneous items \$40.

Jan. 22, Received \$100 cash from Theodore Wheat to apply on account.

Feb. 16, Paid taxes \$88.

Feb. 21, Sold some hay for \$150 cash.

4. From the accounts prepared as directed in problem 3 above,

(a) Close the nominal accounts into Loss and Gain account.

(b) Close Loss and Gain account into Capital account.

(c) Bring down the balance of Capital and Cash accounts on March 1, 1918.

(d) Prepare a Statement of Resources and Liabilities as of February 28, 1918.

(e) Compare the Loss and Gain account and the Statement of

Resources and Liabilities with the ones prepared for Mr. Wood's transactions of the preceding year, as per instructions of problems 1 and 2 above.

5. Make the necessary entries in nominal and other accounts for the transactions given below, using the necessary resource and liability accounts and the following nominal accounts: Board and Room, Books and Stationery, Laundry and Toilet, Amusements and Refreshments, General Expense, Miscellaneous Income, and Allowance (being the income account to show amounts received from home).

September 18, 1916, Eddie Block enrolling as a student in an agricultural college, begins to keep his accounts under double entry¹ system. He accordingly opens his ledger accounts by recording his capital of \$25 which he saved during the summer.

September 19, 1916, paid matriculation fee \$10, semester dues \$12, and laboratory fees \$1.50.

Sept. 20, Received \$30 from home.

Sept. 20, Paid 25 cents for a campus ticket and 50 cents for a swimming pool ticket.

Sept. 20, Paid \$7.60 for textbooks and stationery.

Sept. 22, Paid \$6 for athletic association membership and season tickets.

Sept. 22, Paid room rent for one month \$12.

Sept. 23, Paid \$1 for college Y. M. C. A. membership.

Sept. 23, Paid \$2.50 for subscription to student daily publication.

Sept. 23, Paid for laundry 48 cents and for shine 10 cts.

Sept. 25, Paid for car fare, show and refreshments, 60 cts.

Sept. 25, Borrowed \$5 from "Slim" Small.

Sept. 26, Received \$1.50 for miscellaneous jobs.

Sept. 28, Joined the hospital association and paid \$1 dues.

Sept. 29, Paid \$1 for pressing and cleaning.

Sept. 30, Attended football game with Bertha and paid \$1 for her ticket and 60 cts. for car fare and refreshments.

¹Double entry system involves primarily the expression of equal debits and credits for each transaction—the system used in explanations in this text. Single entry system does not require such equilibrium of debits and credits.

Oct. 1, Spent 50 cents at church.

Oct. 2, Received \$30 from home.

Oct. 3, Paid \$10 for neckties, shirts, socks and a hat (charge "laundry and toilet").

Oct. 3, Paid two weeks' board \$9.

Oct. 3, Took "Slim" and "Zeke" to a show, spending \$1.50.

Oct. 4, Paid \$2 for books and stationery.

Oct. 6, Paid 50 cents for hair cut and shave, 10 cents for shine, and \$1 for pressing suit.

Oct. 6, Attended a dance with Ethel and spent \$2.40, including refreshments and car fare.

Oct. 9, Spent \$3.50 while home with "Zeke" over the week-end.

Oct. 10, Received a letter from home saying they would send me \$30 the first of next week.

Oct. 10, Borrowed \$5 from "Zeke" Sanborn.

Oct. 13, Paid \$4 for a pair of shoes.

Oct. 14, Took Ethel to the football game, spending \$1.70.

Oct. 16, Received a check from home for \$30.

Oct. 17, Paid "Slim" and "Zeke" each the \$5 I owed them.

(a) Close the expense and income accounts into Loss and Gain, and the latter into the Capital account, bringing down the balance of the latter.

(b) Prepare a Statement of Resources and Liabilities as of October 17, 1916.

REVIEW QUESTIONS

1. What two general bookkeeping methods are there for showing increases and decreases in capital?
2. Which one is more often used in practice?
3. Which one involves the use of the greater number of accounts?
4. When all increases and decreases of capital are recorded in one account, how is the net capital of the business determined at the close of the year?
5. When increases and decreases of capital are recorded in several appropriately named accounts how is the net capital of the business determined?

6. Does the Capital account show the same net capital under either method? Why?
7. Name five accounts that have been used to record increases and decreases in capital.
8. What is an Expense account? An Income account? A Nominal account?
9. What is the purpose of the Loss and Gain account?
10. Discuss its relation to the several expense and income accounts.
11. Discuss its relation to the Proprietor's Capital account.
12. Describe the bookkeeping process of transferring balances from the expense accounts to Loss and Gain account.
13. Describe the process of transferring balances from the income accounts to Loss and Gain account.
14. Describe the process of transferring the balance from the Loss and Gain account to the Capital account.
15. Why are the entries mentioned in questions 12, 13 and 14 called closing entries?
16. What do the horizontal double lines mean in an account? The single lines?
17. What is the difference between a Loss and Gain account and a Loss and Gain Statement?
18. Under the second method of recording increases and decreases in capital, why is the balance transferred from Loss and Gain account exactly equal to the net results of the Capital account entries of the year under the first method?
19. Describe the process of bringing down the balance of Capital account.
20. Why is it customary to bring down the balance?
21. How is the equilibrium of debits and credits maintained in bringing down the balance?
22. What do the double lines mean in the Capital account in this connection?
23. Give two classifications of accounts.
24. Of what value is a classification of accounts?
25. What is a personal account? A real account?
26. Name two of each.

CHAPTER IV

THE TRIAL BALANCE

Explanation of Trial Balance Terms.—*A trial balance is a list of debit and credit balances of all ledger accounts. The name is also applied to a list of debit and credit totals of ledger accounts, although the latter also bears the name proof sheet.*

The process of listing the balances or totals from the ledger accounts into the trial balance book or trial balance sheet is known as "taking off a trial balance."

The trial balance is said to be "in balance" if the sums of the debit and credit columns are equal. If the trial balance is in balance, the ledger is said to be in balance, and broadly speaking, the books are said to be in balance.

The trial balance is said to be "off" if the sums of the debit and credit columns are not equal. Likewise, if the trial balance is off the ledger is said to be "off" or "out of balance."

Purpose of the Trial Balance.—The trial balance is prepared for the purpose of testing the accuracy of the entries in the ledger and for supplying amounts to be used in preparing financial statements. It has been stated as a principle of bookkeeping, that each transaction requires a debit and a credit entry of equal amounts in the ledger. It follows that if all transactions are thus correctly recorded, the sum of all debits in the ledger should equal the sum of all credits. From this is derived the principle that the *sum of all debit balances should equal the sum of*

all credit balances, if debits and credits for each transaction have been equal.

Trial Balance Proves What?—This does not mean that if a trial balance is in balance it is an absolute proof of accuracy in recording transactions. It merely indicates that debits and credits of equal amount have been entered. There are several classes of errors that might be made without throwing the trial balance out of balance.

1. For example, if one neglects to record a transaction at all, there is no credit entry and no debit entry made. Consequently, the ledger remains in balance, but the accounts do not reflect the true condition or progress of affairs.

2. Also, if one enters the wrong amount on both the debit and credit sides it does not throw the trial balance off. For example, if he pays \$185 for a horse, but in error debits Horse account and credits Cash for \$158, he does not throw his ledger out of balance, but neither the Horse nor Cash accounts show the facts.

An error of this sort would be found in verifying the cash balance. Periodically, the amount of cash on hand and in the bank is calculated. It should agree with the balance of the Cash account. If \$185 is parted with but the Cash account shows only \$158 paid out, it makes the cash "short," but does not affect the trial balance as long as the Horse account is debited with the same amount, \$158. If, however, Horse account is debited with the correct amount, \$185, while Cash account is credited with \$158, both the trial balance and the Cash account are off. If the Horse account is debited with the wrong amount, \$158, and Cash account credited with \$185, the trial balance is off, but the Cash account is in agreement with the cash on hand and in the bank.

3. If one makes an entry in the wrong account but on the correct side of the ledger, it does not throw the trial

balance off. That is, if he pays \$185 for a horse, debiting Cattle account, in error, and crediting Cash, the trial balance is in balance and the Cash account is correct, but neither the Horse nor Cattle account shows the correct result.

As a means of supplying amounts to be used in financial statements, the trial balance is very useful. The balances recorded in the trial balance present figures in a very concise and convenient form, for use in the Statement of Resources and Liabilities and the Loss and Gain Statement.

Time of Taking a Trial Balance.—A trial balance is taken usually at the close of a month or year after all the transactions are entered in the ledger. It is possible and sometimes practical in commercial bookkeeping to take a trial balance at the close of each day's business. It can be taken at any time during any day after all debits and credits have been made in the ledger for all transactions completed up to that time. It is taken before attempting to prepare financial statements, but the statements can be prepared without taking a trial balance if desired, as has been illustrated in the preceding chapters. The trial balance shows the condition of the ledger accounts at any given moment of time. No attempt should be made to take a trial balance, however, until it is known with reasonable certainty that all transactions have been reflected in the ledger by proper debit and credit entries of equal amounts.

In farm bookkeeping, a trial balance might be taken at any time, but it is considered necessary to take it only at the close of a fiscal year, since the amounts are not needed oftener for financial statements, and transactions are not numerous enough to cause many errors. When transactions are numerous a trial balance taken at short intervals enables one to find existing errors before their location becomes too burdensome.

Procedure in Taking a Trial Balance.—Having decided when the trial balance is to be taken, there are three steps to be followed in taking it.

1. The balance of each account in the ledger is calculated and recorded very lightly in pencil in the explanation column for reference on the side of the account that is larger.

2. The balance of each account is listed in its proper column in the trial balance.

3. The two columns of the trial balance are added and it is seen that the two totals are equal.

Finding the Balance of an Account.—*In order to find the balance of an account, the debit side is added and the total is expressed lightly with a sharp pencil immediately under the last debit entry, as shown in Illustration 12. Then the credit side is added, and the total recorded in a similar manner on the credit side. The difference is found between the debit and credit totals thus recorded in pencil. If the debit total exceeds the credit total, the amount of excess, commonly called the debit balance, is written in pencil in the explanation column of the debit side of the account. (See Illustration 12, Cash Account.) If the credit total exceeds the debit, the balance is written in pencil in the explanation column of the credit side of the account. If there are entries on only one side of the account it is not necessary to show the balance in the explanation column. In such a case the pencil total is also the balance of the account, and it is used in the trial balance as such.*

This process is performed in connection with every account in the ledger. If the debit and credit pencil totals are equal in an account, no amount is written in either explanation column. The account is in balance, and is ready to be ruled off with a single line, total amount and double lines on both sides of the account.

Listing the Balance in the Trial Balance.—The ledger is now in condition for the second step in the procedure. For this purpose, paper is used with two money columns to the right as in simple journal paper. The heading "Trial Balance," followed by the date on which it is taken, is placed at the top of the paper. On the first line of the explanation column to the left is written the name of the first account in the ledger that has a balance indicated. It makes no difference whether the balance is on the debit or credit side, it is entered in the trial balance in the order in which it appears in the ledger. If the pencil balance is written in the explanation column on the debit side of the account, it is entered in the debit column of the trial balance on the same horizontal line with the name of the account. In other words, if the debit side of Labor account, for example, exceeds the credit side by \$300, that amount is to be placed in the debit column of the trial balance on the same horizontal line with the word "labor." The second horizontal line is used similarly for recording the balance of the second account in the ledger. This process is continued until all ledger accounts with balances have been treated in like manner.

Adding and Proving the Trial Balance.—The third step in taking the trial balance is easily accomplished after the balances have been entered on the trial balance sheet. The totals of the debit and credit columns are placed at the foot of the respective columns after having drawn the customary single line to indicate the process of addition. If these debit and credit totals are equal, double lines are drawn under them, as in closing an account. Ascertaining that debit and credit totals are equal is called "proving the trial balance." If the two totals are not equal an error exists, and the double lines should not be drawn beneath the totals. The procedure in looking for errors

is discussed in Chapter V under the title, "Preventing and Finding Errors."

Trial Balance Details Illustrated.—Illustration 12 shows the several ledger accounts prepared for a trial balance, and Illustration 13 shows the trial balance prepared from them according to the principles presented in the several preceding pages.

ILLUSTRATION 12

LEDGER ACCOUNTS PREPARED FOR THE TRIAL BALANCE

Mr. Arnold's Capital

	1916
	Mar. 1 Capital invest- ed..... \$4000

Rent

1917	
Feb. 21 Cash.....	\$400

Labor

1916	
Mar. 31 Cash.....	30
Apr. 30 "	30
May 31 "	30
June 30 "	30
July 31 "	60
Aug. 31 "	30
Sept. 30 "	30
Oct. 31 "	30
Nov. 30 "	30
	<i>300.00</i>

General Expense

1916	
Mar. 30	Cash (Interest) . 6
Mar. 31	" 20
Apr. 16	" (Ins. and Taxes).. 60
May 20	" 10
Sept. 10	" 25
Sept. 16	" 40
Oct. 31	" 25
Dec. 10	" (Interest) . 42
Dec. 20	" 32
1917	
Jan. 31	" 20
Feb. 20	" 20

300.00

Milk

1916	
Apr. 16	Cash..... \$40
May 16	" 60
June 16	" 65
July 16	" 50
Aug. 16	" 20
Sept. 16	" 25
Oct. 16	" 25
Nov. 16	" 15

300.00

Corn

1916	
Dec. 16	Cash..... \$1200

Oats

1916	
Aug. 18	Cash..... 400

Miscellaneous Income

1916	
June 28 Cash (Fruit & Garden truck)	\$20
Oct. 7 Cash (Fruit & Garden truck)	60
Nov. 18 Cash (Garden truck).....	20
	<i>100</i>

Cash

1916	
Mar. 1 On hand.....	\$1000
Apr. 16 Milk.....	40
May 16 "	60
June 16 "	65
June 28 Fruit and Garden truck....	20
July 16 Milk.....	50
Aug. 16 "	20
Aug. 18 Oats.....	400
Sept. 10 Milk.....	25
Oct. 7 Garden truck...	60
Oct. 16 Milk.....	25
Nov. 16 "	15
Nov. 18 Garden truck...	20
Dec. 6 Corn.....	<i>1000</i> 1200
	<i>3000</i>

1916	
Mar. 30 Note Payable.	\$300
Mar. 30 Interest.....	6
Mar. 31 Labor.....	30
Mar. 31 General Expense	20
Apr. 16 Ins. and Taxes	60
Apr. 30 Labor.....	30
May 20 General Expense	10
May 31 Labor.....	30
June 30 Labor.....	30
July 31 Labor.....	60
Aug. 31 Labor.....	30
Sept. 10 General Expense	25
Sept. 16 " "	40
Sept. 30 Labor.....	30
Oct. 31 Labor.....	30
Oct. 31 General Expense	25
Nov. 30 Labor.....	30
Dec. 10 Mortgage Payable.....	700
Dec. 10 Interest.....	42
Dec. 20 General Expense	32
1917	
Jan 31 General Expense	20
Feb. 20 " "	20
Feb. 21 Rent.....	400
	<i>2000</i>

Mr. Bell

1916

Mar. 1 Balance due.... \$500

Horses

1916

Mar. 1 On hand (12)... 1600

Cattle

1916

Mar. 1 On hand (20)... 1100

Equipment

1916

Mar. 1 On hand..... \$800

Mortgage Payable

1916

Dec. 10 Cash paid..... \$700

1916

Mar. 1 Nat'l Imple-
ment Co... \$700*Notes Payable*

1916

Mar. 30 Cash paid..... \$300

1916

Mar. 1 First National
Bank (90 da.) \$300

ILLUSTRATION 13

TRIAL BALANCE FEB. 28, 1917

Mr. Arnold's Ledger

	DR.	CR.
Mr. Arnold's capital.....		\$4000
Rent.....	\$400	
Labor.....	300	
General Expense.....	300	
Milk.....		300
Corn.....		1200
Oats.....		400
Miscellaneous income.....		100
Cash.....	1000	
Mr. Bell.....	500	
Horses.....	1600	
Cattle.....	1100	
Equipment.....	800	
	\$6000	\$6000

Trial Balance Before and After Closing.—The trial balance in Illustration 13 is called a trial balance before closing. This means that it is a list of the balances of the ledger accounts as they appeared immediately after making the entries for the last business transaction on the day of the trial balance, Feb. 28, 1917. Occasion often arises for taking a trial balance after closing. In such cases, the trial balance is a list of the balances of the ledger accounts as they appear after closing the expense and income accounts into the Capital account through Loss and Gain account. If the term "trial balance" is used without qualification it always means "trial balance before closing."

Using the accounts in Illustration 12, the trial balance after closing would appear as in Illustration 14.

ILLUSTRATION 14

TRIAL BALANCE AFTER CLOSING FEB. 28, 1917

Mr. Arnold's Ledger

	Dr.	Cr.
Mr. Arnold's capital.....		\$5000
Cash.....	\$1000	
Mr. Bell.....	500	
Horses.....	1600	
Cattle.....	1100	
Equipment.....	800	
	<u>\$5000</u>	<u>\$5000</u>

By comparing this trial balance with the one before closing (Illustration 13) it is seen that in Illustration 14 the Capital account is greater and the nominal accounts do not appear, while the accounts with the resources are the same as in the trial balance before closing. In other words, the trial balance after closing contains only the items that appear in the Statement of Resources and Liabilities. In fact, in simple cases, the trial balance after closing can be used as a substitute for the Statement of Resources and Liabilities. The only difference between them is in the form. This can be seen from a comparison of the trial balance after closing Illustration 14 with the Statement of Resources and Liabilities of Illustration 6. Both are prepared direct from the same set of ledger accounts.

Preparation of Statements from Trial Balance.—As pre-

viously stated, one of the purposes of a trial balance is to supply amounts to be used in preparing financial statements. To assist in the preparation of statements, the accounts in the trial balance are marked with appropriate letters to indicate the position of each in the financial statements. For this purpose "E" means expense, "I" income, "R" resource and "L" liability. To illustrate more fully the preparation of statements from the trial balance, the trial balance of Illustration 13 is reproduced below with the appropriate letters properly used.

ILLUSTRATION 15

TRIAL BALANCE MARKED FOR PREPARING STATEMENTS.

TRIAL BALANCE, FEB. 28, 1917, MR. ARNOLD

	Dr.	Cr.
L Mr. Arnold's capital		\$4000
E Rent	\$400	
E Labor	300	
E General Expense	300	
I Milk		300
I Corn		1200
I Oats		400
I Miscellaneous income		100
R Cash	1000	
R Mr. Bell	500	
R Horses	1600	
R Cattle	1100	
R Equipment	800	
	\$6000	\$6000

From a study of the initials placed before the names of the accounts it is seen that *all debit balances are marked*

as expenses or resources and all credit balances as incomes or liabilities.

Using the items of Illustration 15, the Loss and Gain Statement contains on the left or debit side all those debit balances marked "E," and on the credit side all those balances marked "I" as in Illustration 16. The balance is placed on the smaller side, in this case the debit side, in order to make the two sides equal. The balance is a gain because incomes exceed expenses.

ILLUSTRATION 16

LOSS AND GAIN STATEMENT PREPARED FROM A TRIAL BALANCE.

LOSS AND GAIN STATEMENT FOR THE YEAR ENDED FEB. 28,
1917, MR. ARNOLD

Rent.....	\$400	Milk.....	\$300
Labor.....	300	Corn.....	1200
General Expense.....	300	Oats.....	400
Balance, net gain.....	1000	Miscellaneous Inc.....	100
	<hr/>		<hr/>
	\$2000		\$2000
	<hr/>		<hr/>

The Statement of Resources and Liabilities as shown in Illustration 17 contains on the left or resource side all those debit balances marked "R" and on the right or liability side, all those balances marked "L."

Relation Between Trial Balance and Financial Statements.—A further study of the trial balance in Illustration 15 in its relation to the Loss and Gain Statement and Statement of Resources and Liabilities in Illustrations 16 and 17, respectively, presents additional points in accounting. All the items on the debit side of the trial balance are placed on the debit side of one of the statements. All items on the credit side of the trial balance are placed on

ILLUSTRATION 17

STATEMENT OF RESOURCES AND LIABILITIES PREPARED FROM A
TRIAL BALANCE.STATEMENT OF RESOURCES AND LIABILITIES,
FEB. 28, 1917, MR. ARNOLD

<i>Resources</i>		<i>Liabilities</i>	
Cash.....	\$1000	Mr. Arnold's	
Mr. Bell.....	500	capital Feb.	
Horses.....	1600	28, 1916...\$4000	
Cattle.....	1100	Add net gain	
Equipment.....	800	for year... 1000	5000
	<hr/>		<hr/>
	\$5000		\$5000
	<hr/>		<hr/>

the credit side of one of the statements. No other amounts appear in the statements except the net gain, which appears on the debit side of one statement and the credit side of the other. Therefore, since the debit and credit totals of the trial balance are equal, the debit and credit totals of the two statements taken together are equal. That is, the two statements are in balance. The \$1000 balance in the Loss and Gain Statement is transferred to the Statement of Resources and Liabilities in much the same way as it was transferred from Loss and Gain account in the ledger to Mr. Arnold's Capital account.

Stated in another way, the Statement of Resources and Liabilities itself contains all the items of the trial balance. It contains as separate items all the balances indicated in the trial balance as resources or liabilities, and contains in one amount the net result of all the other balances in the trial balance. Thus, in Illustration 17, the \$1000 added to Mr. Arnold's capital is the net result of all the trial

balance items not otherwise specifically listed in the Statement of Resources and Liabilities. This net result is obtained through the medium of the Loss and Gain Statement.

The Loss and Gain Statement, then, might be called an analysis of the one item in the Statement of Resources and Liabilities which is added to the capital to show the total present liability to the proprietor. It should be recalled in this connection that the capital in the trial balance before closing (Illustration 13) is the capital at the beginning of the fiscal period, while the capital in the trial balance after closing (Illustration 14) is the capital at the close of the period, after transferring to it the gain of the period.

The amount shown as capital in the last column of the Statement of Resources and Liabilities (Illustration 17) is the same as the balance of the Capital account in the trial balance after closing (Illustration 14).

Two Methods of Preparing Financial Statements.—As a result of these comparisons between trial balances and statements we find that there are two general methods of preparing the financial statements, in simple cases, after the trial balance has been prepared.

1. The expense and income accounts are closed into the Capital account through the Loss and Gain account, and a trial balance is taken after closing. The Loss and Gain Statement is then prepared by merely copying the Loss and Gain account, while the Statement of Resources and Liabilities is prepared by copying the trial balance after closing in slightly different form.

2. Using the trial balance before closing, the Loss and Gain Statement is prepared and then the balance of net gain or loss is used in the Statement of Resources and Liabilities as an addition to or subtraction from capital.

(This is the method used in Illustrations 15, 16, and 17.) All other items in the Statement of Resources and Liabilities are taken direct from the trial balance before closing.

The latter method does not serve as a substitute for the process of closing the ledger. It merely permits of the preparation of statements before closing the expense and income accounts into Capital account. The closing of the ledger is performed in exactly the same way (but not at the same time), regardless of which method is used in preparing financial statements. Under the first method the ledger is closed before the statements are made; under the second method after the statements are made.

For farm accounting, the first method is advocated because of the simplicity of operation when there are several classes of inventories to be considered. Also, in farming, there is seldom any necessity for preparing financial statements for silent partners, directors, stock holders or the investing public as there is in commercial enterprises.

Although in commercial accounting the financial statements are prepared on loose sheets of paper, which may or may not be filed in permanent binders, it is considered more practical in farm accounting to reserve a number of pages in the back of the ledger for the annual statements.

ILLUSTRATIVE PROBLEMS

1. From the trial balance presented herewith, prepare a Loss and Gain Statement for the year and a Statement of Resources and Liabilities as of December 31, 1916.

FARM ACCOUNTING

TRIAL BALANCE, DECEMBER 31, 1916, EDWARD BLY

	Dr.	Cr.
Cash.....	\$1000	
Notes Receivable.....	200	
Edward Bly Capital Account.....		\$4200
General Expense Account.....	216	
Interest.....	95	
Notes Payable.....		160
Mortgage Payable.....		1000
Land.....	4000	
Horses.....	800	
Cattle.....	200	
Poultry.....		25
Equipment.....	500	
Corn.....		450
Hay.....		460
Tobacco.....		700
Oats.....		300
Ed Olson.....	84	
James Simpson.....		60
Labor.....	260	
	<u>\$7355</u>	<u>\$7355</u>

Note for Instructor.—Solutions of problems 2 and 3 below should be preserved and used for comparison later as indicated in Illustrative Problem 4, Chapter V.

2. From the transactions given below follow instructions in the order given, namely

(a) Create the necessary ledger accounts allowing enough space for each account to receive the entries of problem 3 below.

(b) Take a trial balance at February 28, 1917.

(c) Close the ledger.

(d) Take a trial balance after closing.

(e) Prepare a Loss and Gain Statement for the year, and a Statement of Resources and Liabilities at the close of the year.

Mar. 1, 1916, Frank Rodgers began farming operations for the year with resources and liabilities as follows: Cash \$150, Notes Receivable \$480, owing by brother Walter Rodgers \$100, Equipment \$1455, Horses and Mules \$1900, Cattle \$600, Hogs \$500, Poultry \$50, Land \$7000, Buildings \$3000, Mortgage Payable \$4000, Note Payable \$200, owing to a neighbor John Long \$35.

Mar. 16, Paid cash for insurance \$55.

Mar. 18, Sold some eggs for \$5 (credit poultry).

Mar. 31, Sold some hogs for \$300 cash.

Mar. 31, Paid wages in cash, \$30.

Apr. 5, Paid \$65 for miscellaneous items.

Apr. 6, Sold eggs for \$4.

Apr. 26, Paid \$120 interest on mortgage (debit interest account).

Apr. 30, Paid \$30 for labor.

Apr. 30, Sold eggs for \$6.

May 31, Paid \$30 for labor.

June 15, Sold fruit for \$20.

June 16, Received \$50 from brother Walter on account.

June 30, Paid \$30 for labor.

July 7, Paid for miscellaneous items \$15.

July 7, Sold garden truck and fruit for \$30.

July 31, Paid for labor \$45.

Aug. 1, Paid for new equipment \$45.

Aug. 18, Sold some spring chickens for \$10.

Aug. 21, Sold oats for \$400.

Aug. 31, Sold wheat for \$300.

Aug. 31, Paid for labor \$50.

Sept. 4, Paid my note for \$200, and interest \$12.

Sept. 30, Paid \$30 for labor.

Oct. 8, Paid John Long \$20 on account.

Oct. 26, Paid \$120 interest on mortgage.

Nov. 8, Sold timothy hay for \$150.

Nov. 30, Paid for labor \$40.

Dec. 4, Sold corn for \$600.

Feb. 15, 1917, Paid taxes amounting to \$79.

Feb. 24, Received \$24 interest on note receivable (credit interest account).

Feb. 28, Disposed of all hogs for \$400 cash and sold all the poultry for \$55 cash.

Feb. 28, Loaned a neighbor, James Lewis, \$1000, taking the latter's promissory note as security. (Dr. Notes receivable, Cr. Cash \$1000.)

(Note.—The balances of Hog and Poultry accounts in the problem above are incomes.)

3. After completing the work of the year as outlined in problem 2, Mr. Frank Rodgers asks you to record his transactions for the succeeding fiscal year and to follow the same instructions at the close of the year as were given for the year ended Feb. 28, 1917.

His transactions are as follows:

Mar. 10, 1917, Sells some corn for \$200 cash.

Mar. 15, Pays cash for insurance \$60.

Mar. 31, Pays \$25 for wages.

Apr. 1, Buys some poultry for \$24.

Apr. 7, Spends \$40 for miscellaneous items.

Apr. 10, Sells eggs for \$5.

Apr. 17, Among the miscellaneous items purchased on April 7 was some cement costing \$15. It was found to be caked so is returned and the money refunded. (The same account should be credited now that was debited at the time of purchase, Why?)

Apr. 26, Pays \$120 interest on mortgage note.

Apr. 30, Pays \$35 for labor.

May 16, Sells eggs for \$8.

May 31, Pays \$32 for labor.

June 20, Sells fruit for \$10.

June 30, Receives cash from Walter Rodgers to balance his account.

July 3, Sells hay to W. L. Brown \$120 on account.

July 24, Receives \$18 from sale of fruit and garden truck.

July 25, Mr. W. L. Brown, to whom the hay was sold on July 3, calls attention to an error in calculating the amount. It should have been \$102. He gives his check for \$102 to settle the account. (What is to be done with the \$18 difference?)

July 31, Pays \$80 for labor.

Aug. 13, Buys some new equipment for \$60 cash.

Aug. 25, Pays \$12 for cement, for sundry repair work.

Aug. 28, Receives \$30 for six months' interest on note of James Lewis.

Sept. 1, Sells some oats for \$550.

Sept. 30, Pays labor \$65.

Oct. 1, Pays John Long enough to balance his account.

Oct. 24, Sells some wheat for \$2000 cash.

Oct. 26, Pays \$120 for six months' interest on mortgage note.

Oct. 26, Pays \$2000 on mortgage note.

Oct. 27, Sells his poultry for \$35.

Oct. 31, Wages are paid in cash \$30.

Nov. 30, Pays for labor \$40.

Dec. 20, Pays \$300 to carpenter for building a new shed.

Jan. 17, 1918, Donates \$20 to charity.

Feb. 24, Receives \$24 for one year's interest on note.

Feb. 24, Receives \$480 in full of note of that amount.

Feb. 26, Pays taxes amounting to \$90.

4. Compare the financial statements prepared in problem 3 with those prepared in problem 2. Be ready for an oral or written discussion on the changes that took place.

REVIEW QUESTIONS

1. What is a trial balance?
2. What is meant by "taking off a trial balance"?
3. When is a trial balance said to be "in balance"? When is it "off"?
4. When is a ledger said to be "in balance"? When is it "out of balance"?
5. What are the two main purposes of a trial balance?
6. From an arithmetical point of view why are the sums of the debit and credit ledger balances equal, barring errors?
7. What does a trial balance prove?
8. Name three classes of errors that might be made in connection with the debits and credits of a transaction without causing the trial balance to be out of balance.

9. When may a trial balance be taken?
10. What is the customary time for taking a trial balance?
11. Name the three general steps in taking a trial balance.
12. How is the balance of an account found and recorded preparatory to taking a trial balance?
13. What kind of paper is suitable for taking a trial balance?
14. Describe the process of taking a trial balance after the ledger accounts have been prepared for it and the paper is ready for the recording of the trial balance figures.
15. Describe the last step in the completion of a trial balance.
16. What is meant by a trial balance before closing? After closing?
17. Discuss the difference between a trial balance before closing and a trial balance after closing as regards contents.
18. Discuss the difference between a trial balance after closing and a Statement of Resources and Liabilities.
19. In preparing financial statements from a trial balance what preliminary step is advisable?
20. All debit balances in a trial balance appear where in the statements?
21. All credit balances in a trial balance appear where in the statements?
22. Why is it correct to say that the Statement of Resources and Liabilities contains all the items in the trial balance?
23. What is the relation between the Loss and Gain Statement and the Statement of Resources and Liabilities? Is there anything in common?
24. What difference exists between the Capital account in a trial balance before closing and after closing?
25. Describe the two general methods of preparing financial statements.
26. Which method is considered better in farm accounting? Why?
27. In farm accounting, where is a practical place to preserve financial statements?

CHAPTER V

BOOKS OF ORIGINAL ENTRY

The Ledger as an Only Book of Entry.—The ledger has been used in the preceding chapters as the basis of all accounting information. The essentials of all business transactions were recorded in it, and all subsequent information concerning the transactions and their aggregate effect on the progress and condition of the business was derived from it. The trial balance, Statement of Resources and Liabilities and Loss and Gain Statement were prepared from the ledger. *In fact, as previously suggested, the ledger is the book into which all essential financial information of a business is placed, and out of which data are collected, sorted and correlated as a basis for conclusions and constructive criticisms of the business.* This principle is followed out in all good commercial accounting, and applies with equal significance to farm accounting.

The ledger can be used as the only book of record for a business. In commercial bookkeeping it is not the practice to use it as the only book of record. In farm accounting precedent does not influence its use in that way, but other factors render it more desirable to use other books in connection with it.

Five Reasons for Using Books of Original Entry.—In commercial bookkeeping there are five reasons for using other books, known as books of original entry, in which debits and credits are expressed before transferring them to the ledger accounts. It should be remembered, however, that these books of original entry do not alter the main

usefulness of the ledger in any way. Even with the use of books of original entry the ledger accounts receive all the debits and credits ultimately, and hold them in permanent form for use later. Likewise, the financial statements are prepared in exactly the same way, whether books of original entry are used or not.

The five reasons for the use of books of original entry in connection with the ledger in commercial accounting may be summarized as follows:—

1. *To supply a chronological list of business transactions.* Occasions arise in which it is desirable to know in what order transactions occurred.

2. *To present in one place in compact form both the debits and credits involved in a transaction and some explanation concerning it.* When entries are made direct to the ledger account, it is often difficult to record all the explanation that should be made concerning the transaction, also at any later date it causes delay in finding out what two or more accounts were affected by the transaction.

3. *To permit of division of labor, when transactions are numerous.* When several bookkeepers are needed to handle the transactions, several books of original entry may be used at the same time by different employees, the results being assembled afterwards into the ledger.

4. *To assist in the prevention of errors, or in their discovery.* For example, if only the ledger is used, the bookkeeper might record the debit. Then while he is turning to the page on which the credit is to be recorded he is interrupted and forgets to make the credit entry. This would throw his ledger out of balance and would be one of the most difficult classes of error to discover, under the conditions. With similar conditions when books of original entry are used the unfinished entry would usually be noticed at the time of recording the next transaction. If it were not, the error could easily be found by a scrutiny of

the books of original entry when the ledger or trial balance was found to be off.

5. *To reduce the amount of detail recorded in the ledger, and thus make it a more compact and permanent record without destroying its usefulness.* This is accomplished by the use of any or all of the books of original entry with the exception of the simple journal when used alone. In all books except the latter, provision is made for classifying transactions in such a way that a number of debits or credits to the same account may be transferred in total to the ledger account involved.

With the exception of the third, that of the division of labor, the reasons given above would apply to farm accounting as well as to commercial accounting. Therefore, the use of books of original entry is advantageous on the farm, if the proper book or books can be selected. Such books should satisfy the conditions mentioned above without requiring any more work than would be encountered in using the ledger alone.

Posting.—Books of original entry are used for the purpose of expressing debits and credits as transactions arise. The actual debit or credit to the account does not occur until the debit or credit so expressed is transferred to the ledger account. *The process of transferring debits and credits from books of original entry to the ledger accounts is called posting.* Posting might refer to the transfer of one expressed debit or credit at a time, or it might refer to the transfer of a total obtained in a book of original entry having special columns.

It follows that if the ledger is to get its data second hand, so to speak, the books of original entry should show at least as much information concerning the transaction as would be shown in the ledger when it is used alone. All books of original entry are so designed as to show this much, and most of them show more.

Characteristics of Specific Books of Original Entry.—

The most common books of original entry in use by commercial trading concerns are:

Journal

Simple
Columnar
Cash

Sales Book

Simple
Columnar

Cash Book

Simple
Columnar

Purchase Book

Simple
Columnar

There are numerous other books in use depending on the size, nature and organization of the business. There are also a great variety of forms in use of each of the four books mentioned. The variety exists chiefly in the columnar books, those books having special columns in which to record debits or credits of like nature.

In farm accounting the journal and cash book are the only ones considered practical. The sales and purchase books are not needed because the transactions are not numerous enough to warrant their use. *The cash journal is the book of original entry best adapted to farm use.* For that reason it is discussed as a separate book after the presentation of the simple journal and cash book.

Simple Journal.—In general when the term “journal” is used it means simple journal unless otherwise specified. However, if a cash journal or columnar journal is in use in a given business, the word “journal” is used to designate the one in use regardless of what kind it might be. For example, if a farmer uses a cash journal and a ledger, he speaks of the former as his “journal” without necessarily using the full, correct name.

If only one book of original entry is to be used in connection with a ledger, the journal is the only book that will

satisfy the requirement. The debit and credit of any transaction can be expressed in the simple journal or in the cash journal. This is not true of any other book of original entry. For this reason the journal form is usually used in discussion and for analytical purposes to present debits and credits in the most compact form.

The simple journal is so arranged that each debit and each credit must be posted as separate items to the ledger accounts. With its use, the ledger accounts contain exactly the same number of items that they do when the ledger is used alone.

Simple Journal Entries Illustrated.—The general form, contents and explanation of the simple journal entry may be seen from the few simple transactions presented below.

TRANSACTION:

January 1, 1916, Walter Marsh opens a set of books and has \$2500 cash with no other resources.

ENTRY:

(Simple) Journal	WALTER MARSH	DR.	CR.
------------------	--------------	-----	-----

January 1, 1916

I have decided today to open a set of double entry¹ account books for my business, beginning with the following entry to record my resources.

Cash	\$2,500	
Walter Marsh Capital		\$2,500

TRANSACTION:

January 2 Paid cash as follows: for horses \$700, hogs \$500, cattle \$200, equipment \$300.

¹It should be recalled that "double entry" implies the twofold effect of every transaction—debits and credits of equal amounts. It does not derive its name in any way from the fact that entries are made first in a book of original entry and then posted.

*ENTRY:**January 2*

Horses.....	\$700	
Hogs.....	500	
Cattle.....	200	
Equipment.....	300	
Cash.....		\$1,700
(Bought stock and equipment for cash)		

TRANSACTION:

January 31, paid \$25 for labor

*ENTRY:**January 31*

Labor.....	\$25	
Cash.....		\$25
(Paid Jas. Brown for Jan.)		

These and other transactions were entered during the half year, at the close of which the journal contained the entries as presented in Illustration 18.

The ledger accounts created by the posting of the journal entries are shown in Illustration 19. The entries in the journal are to be studied and the postings traced to the proper ledger accounts. The figures to the left of the titles of accounts in the journal are posting references. They indicate the pages in the ledger on which the accounts are to be found. Likewise, the figures in the ledger accounts to the left of the amounts indicate the pages in the journal from which the items were posted. In the case at hand, it is considered that all journal entries are on page 1, and all ledger accounts on page 1.

ILLUSTRATION 18

SIMPLE JOURNAL ENTRIES

(Simple) Journal	WALTER MARSH	DR.	CR.
------------------	--------------	-----	-----

January 1, 1916

I have decided today to open a set of double entry account books for my business, beginning with the following entry to record my resources.

1	Cash.....	\$2,500	
1	Walter Marsh Capital.....		\$2,500

2

1	Horses.....	700	
1	Hogs.....	500	
1	Cattle.....	200	
1	Equipment.....	300	
1	Cash.....		1,700
	(Bought stock and equipment for cash)		

31

1	Labor.....	25	
1	Cash.....		25
	(Paid Jas. Brown for Jan.)		

February 28

1	Labor.....	25	
1	Cash.....		25
	(Paid Jas. Brown for Feb.)		

March 31

1	Labor.....	25	
1	Cash.....		25
	(Paid Jas. Brown for Mar.)		

April 12

1	General Expense.....	21	
1	Cash.....		21
	(Paid for sundry items, enumerated)		

30

1	Labor.....	30	
1	Cash.....		30
	(Paid Jas. Brown for Apr.)		

May 31

1	Labor.....	30	
1	Cash.....		30
	(Paid Jas. Brown for May)		

June 10

1	Cash.....	750	
1	Hogs.....		750
	(Sold all the hogs)		

18

1	Cash.....	34	
1	Misc. Income.....		34
	(Sold garden truck and fruit)		

30

1	Labor.....	35	
1	Cash.....		35
	(Paid Jas. Brown for June)		

Ledger Accounts Posted from Journal Entries.—After the entries are recorded in the journal, it is necessary to post them to the several ledger accounts affected. The ledger accounts in Illustration 19 are the ones made as a result of posting the journal entries of Illustration 18.

ILLUSTRATION 19

LEDGER ACCOUNTS PREPARED FROM JOURNAL ENTRIES OF
ILLUSTRATION 18

Cash

1916				1916			
Jan.	1	Invested	1.... \$2,500	Jan.	2	Sundries	1.... \$1,700
June	10	Hogs	1.... 750	Jan.	31	Labor	1.... 25
June	18	Misc.	1.... 34	Feb.	28	Labor	1.... 25
				Mar.	31	Labor	1.... 25
				Apr.	12	Sundries	1.... 21
				Apr.	30	Labor	1.... 30
				May	31	Labor	1.... 30
				June	30	Labor	1.... 35

Horses

1916			
Jan.	2	Cash	1.... \$700

Hogs

1916				1916			
Jan.	2	Cash	1.... 500	June	10	Cash	1.... 750

Cattle

1916			
Jan.	2	Cash	1.... 200

Equipment

1916			
Jan.	2	Cash	1.... 300

Walter Marsh Capital

		1916
		Jan. 1 Net Investment 1 \$2,500

Labor

1916		
Jan. 31 Cash	1....	\$25
Feb. 28 Cash	1....	25
Mar. 31 Cash	1....	25
Apr. 30 Cash	1....	30
May 31 Cash	1....	30
June 30 Cash	1....	35

General Expense

1916		
Apr. 12 Cash	1....	21

Miscellaneous Income

		1916
		June 18 Cash 1.... 34

Posting from Simple Journal.—It will be observed from a study of Illustrations 18 and 19 that the process of posting from the simple journal is not at all complicated, as it is performed in accordance with a well defined plan. In posting from the simple journal to the ledger it is advisable to look at only one horizontal line at a time, in order to get all the essentials for posting. For example, using the first item of the second journal entry in Illustration 18, this item expresses a debit to Horse account of \$700 on January 2, 1916. Looking only at this one line, we know

first that since the \$700 is in the debit column of the journal, it must be posted to the debit side of the ledger somewhere. The exact place in the ledger is found to be Horse account, when we follow along the horizontal line to the left of the amount in the journal.

The next item in the journal is \$500 in the debit column. Therefore \$500 must be placed on the debit side of the ledger. The exact place in the ledger is found to be Hogs account, when we look to the left along the same horizontal line. Cattle and Equipment accounts are similarly debited. Likewise the item in the credit side of this entry must appear on the credit side of the ledger under the Cash account.

The journal entry under discussion is called a compound journal entry because it has more than one debit and one credit. The sum of the debits of a compound entry must always equal the sum of the credits.

The same principles are followed in posting all other debits and credits from the journal to the ledger. The work is largely mechanical, but requires great care in order to avoid errors. *It may be said that one performs the mental work at the time of framing the journal entries, and that he is merely following the instructions of the entries in posting them to the ledger.*

Simple Cash Book.—The simple cash book usually is so arranged that both the left and right-hand pages are in use at the same time, the left one for cash received and the right one for cash paid. Each page has vertical columns and lines quite similar to the simple journal.

On the left-hand side of the cash book are entered in chronological order all amounts of cash received, and on the right hand side all amounts of cash paid out. Cash includes all currency, coins, checks, bank drafts and money orders, but not promissory notes. When for example \$2500 cash is received as investment of the proprietor, the

ILLUSTRATION 20

SIMPLE CASH BOOK ENTRIES

(Simple) CASH BOOK		WALTER MARSH	
(Left hand page)		(Right hand page)	
<i>Received</i>		<i>Paid Out</i>	
1916		1916	
Jan. 1 W. Marsh Cap.	1 \$2,500	Jan. 2 Horses	1 \$700
June 10 Hogs	1 750	Jan. 2 Hogs	1 500
June 18 Misc. Income	1 34	Jan. 2 Cattle	1 200
		Jan. 2 Equipment	1 300
		Jan. 31 Labor	1 25
		Feb. 28 Labor	1 25
		Mar. 31 Labor	1 25
		Apr. 12 General Exp.	1 21
		Apr. 30 Labor	1 30
		May 31 Labor	1 30
		June 30 Labor	1 35
			1 1,891
		June 30 Bal. down	1,393
	<hr/>		<hr/>
	1 \$3,284		\$3,284
	<hr/>		<hr/>
1916			
July 1 Bal. down	\$1,393		

entry on the left side of the cash book expresses the same debit and credit as would be expressed in the journal for the same transaction. In the case just cited the cash book entry must be made in such a way as to express a debit to cash and a credit to the Proprietor's Capital account.

The form of the entry in the cash book is not the same as in the journal. It is a form which permits of a more compact record, with less writing, less posting and fewer figures.

The simple cash book cannot be used as an only book of original entry unless all transactions involve cash. This condition seldom exists. Accordingly the simple cash book is usually used in conjunction with the journal. The cash book, then, is used for recording all cash transactions and the journal for all transactions not involving cash.

Illustrations 20 and 21 present the simple cash book and the ledger accounts created therefrom. For comparative purposes the same transactions are used as were used in presenting the journal in Illustration 18, all of which involved cash. The ledger page to which posting is made is recorded to the left of the cash book amount.

ILLUSTRATION 21

LEDGER ACCOUNTS PREPARED FROM CASH BOOK ENTRIES OF ILLUSTRATION 20

Cash

1916				1916			
June 30	Total	Rec'd	1	\$3,284	June 30	Total paid out	1 \$1,891

Horses

1916			
Jan.	2	Cash	1 700

Hogs

1916				1916			
Jan.	2	Cash	1	500	June 10	Cash	1 750

Cattle

1916			
Jan.	2	Cash	1 200

Equipment

1916		
Jan. 2	1	300

Walter Marsh Capital

1916		
Jan. 1	Net Invest.	1 2,500

Labor

1916		
Jan. 31	Cash	1 \$25
Feb. 28	Cash	1 25
Mar. 31	Cash	1 25
Apr. 30	Cash	1 30
May 31	Cash	1 30
June 30	Cash	1 35

General Expense

1916		
Apr. 12	Cash	1 21

Miscellaneous Income

1916		
June 18	Cash	1 34

Posting from Simple Cash Book.—From a study of Illustrations 20 and 21, it is observed that there is only one item posted to each side of the Cash account. This reduction in the amount of posting is due to the arrangement of the cash book. It is not necessary to post each item to

the debit side of Cash account in the ledger because every item on the cash received or left hand page expresses a debit to cash. The same result is obtained by posting only the total of all the items. Similarly, the total of the cash paid out is posted to the credit side of Cash account. It is noted that the abbreviated way of expressing debits and credits in the cash book requires the writing of the amount only once, while in the journal the amount was expressed twice in each entry. *The writing of the words "cash received" at the top of the page in the cash book is equivalent to writing "Each amount on this page expresses a debit to Cash account and a credit to the account named on the same horizontal line to the left of the amount."* Similarly, *the use of the words "cash paid out" at the top of the right-hand page is equivalent to writing "Each amount on this page expresses a credit to Cash account and a debit to the account named on the same horizontal line to the left of the amount."*

These facts give rise to a procedure which many beginners in bookkeeping find difficult to master, namely, that in posting from the left hand page of the cash book, the individual items are posted to the credit side of the ledger accounts named; and in posting from the right hand page of the cash book, the individual items are posted to the debit side of the ledger accounts named. The reason for the apparent difficulty lies in the fact that the average beginner does not have a clear conception of ledger accounts before he learns about posting. Debits and credits may be expressed in a variety of ways in books of original entry. In order to post intelligently one must know that a debit expressed anywhere must ultimately be posted to the debit side of some account in the ledger.

The Cash Journal.—The cash journal as used in commercial enterprises is a book that is criticized by auditors, but the criticisms in that connection do not hold in farm

accounting. Except from the auditor's point of view, the book is a very useful one. Especially is its use adapted to the farm because of the fact that all transactions can be recorded in the one book of original entry and because a great saving is made in the amount of posting. It is not practical to use the simple journal alone because of the volume of posting. The cash book, if used, must always be accompanied by the journal, thus necessitating the use of two books aside from the ledger, if the simple cash book is used.

A variety of forms may be devised for the cash journal. *The principle upon which all cash journals are founded, however, is that special debit and credit columns are provided for those accounts which are affected the greatest number of times by transactions in the business in question. In any business, cash is usually affected a great many times. This always gives rise to the use of special columns for cash, which fact is largely responsible for the name of the book.*

Besides the cash columns there are invariably at least two other columns, one on the debit and one on the credit side. *If there is only one column on each side of the cash journal in addition to the cash column, such additional columns are called "sundry" and are used in the same way as the columns of the simple journal. A cash journal, then, always has at least two debit and two credit columns, and it may have as many more as are demanded by the nature of the transactions. It is not necessary that there be an equal number of debit and credit columns, but it is essential that debits and credits of equal amount shall be expressed for each transaction.*

Illustrations 22 and 23 present the cash journal, and the ledger accounts created from its entries. For comparative purposes, the same transactions are used as in Illustrations 18 and 19, in which the journal was used alone; and in

ILLUSTRATION 22

CASH JOURNAL ENTRIES

Cash Journal

WALTER MARSH

Labor Dr.	Cash Dr.	Fo.	Sundry Dr.	Items	Fo.	Sundry Cr.	Cash Cr.
	\$2,500			Jan. 1, 1916 Cash, W. Marsh Cap. (Orig. Invest.) 2	1	\$2,500	
		1	\$700	Horses			
		1	500	Hogs			
		1	200	Cattle			
		1	300	Equipment, cash (Bought property for cash)			\$1,700
\$25				31 Labor, cash (J. Brown for Jan.) Feb. 28			25
25				Labor, cash (J. Brown for Feb.) Mar. 31			25
25				Labor, cash (J. Brown for Mar.) Apr. 12			25
		1	21	Gen. Exp. cash (Sundry items bought, viz.: ..)			21
				30			
30				Labor, cash (J. Brown for Apr.) May 31			30
30				Labor, cash (J. Brown for May) June 10			30
	750			Cash, hogs (Sold all hogs) 18	1	750	
	34			Cash, Misc. Income (Sold fruit and vege- tables) 30	1	34	
35				Labor, cash (J. Brown for June)			35
\$170	\$3,284		\$1,721			\$3,284	\$1,891
		1	3,284	Cash	1	1,891	
		1	170	Labor			
			\$5,175			\$5,175	

July 1
Cash balance,
\$1,393

20 and 21, in which the cash book was used alone. The columns are used to fit this particular case but are quite representative. The ledger pages are indicated in the cash journal in the columns to the left of the amount in the "sundry" columns.

ILLUSTRATION 23

LEDGER ACCOUNTS PREPARED FROM CASH JOURNAL OF
ILLUSTRATION 22

Cash

1916		1916	
June 30 Rec'd	1 \$3,284	June 30 Paid out 1....	\$1,891

Horses

1916			
Jan. 2 Cash	1 700		

Hogs

1916		1916	
Jan. 2 Cash	1 500	June 10 Cash 1....	750

Cattle

1916			
Jan. 2 Cash	1 200		

Equipment

1916			
Jan. 2 Cash	1 300		

Walter Marsh Capital

		1916	
	Jan. 1	Net Invest. 1..	2,500

Labor

		1916	
June 30	Cash	1	170

General Expense

		1916	
Apr. 12	Cash	1	21

Miscellaneous Income

		1916	
	June 18	Cash 1.....	34

Posting from the Cash Journal.—From an examination of the cash journal and the ledger accounts as presented in Illustrations 22 and 23, it is seen that the ledger accounts are more condensed than in Illustrations 19 and 21, when the ledger was prepared from the simple journal and simple cash book, respectively, with the same group of transactions. The Labor account has only one entry, which is the total of the labor debit column of the cash journal. The Cash account has only one entry on each side, as it did in the ledger prepared from the cash book.

In posting from the cash journal the items in the sundry columns are posted individually while those in the other columns are posted in total. Before posting the totals, they are carried into the sundry columns for two reasons:

1. In order to have all postings made from one debit column and one credit column.

2. To bring all amounts into the two columns, one debit and one credit, so that it can be seen more easily whether the sum of the debits equals the sum of the credits. In Illustration 22 the sum of the three debit columns is shown as \$5175 and the sum of the two credit columns as \$5175. Apparently, debits and credits of equal amount have been made for all the transactions. The balance of cash is shown in the explanation column on the first day of the succeeding period as in the Illustration.

The columns used in this problem were selected because Labor was found to be the account with the most entries in Illustration 21, while, of course, the cash and sundry columns are essential in all cash journals.

Optional Form for Cash Journal.—Because of inability to procure appropriate blank account books ruled for use as a cash journal similar to the one shown in Illustration 22, another form is often used. This optional form has the explanation columns to the left, followed by the several money columns. Under this form¹ the money columns may be grouped by accounts or by debits and credits. When they are grouped by accounts the columns from left to right might be as follows, using the headings employed in Illustration 22: Explanation space, Sundry Dr., Sundry Cr., Cash Dr., Cash Cr., Labor Dr. When they are grouped by debits and credits, the columns would be arranged in some such way as this: Explanation space, Sundry Dr., Cash Dr., Labor Dr., Sundry Cr., Cash Cr.

Under either of these optional methods, the general principles of entering and posting transactions apply as explained for the cash-journal form in Illustration 22. That

¹ Blank books for use as cash journals may be obtained at stationery stores. Books with six, eight, twelve, fourteen or eighteen columns may be used, depending on the requirements of the business. A twelve or fourteen column one is best for all general farming purposes.

is, the debits and credits to accounts not represented by special columns are recorded in the sundry columns; the totals of all debit columns are summarized at the end of the debit sundry column, and of all credit columns at the end of the credit sundry column.

When an item is entered in a sundry column it does not mean a debit or a credit to an account called "sundry." The name of the account to be debited or credited is placed in the explanation column on the same horizontal line with the amount in question. The ledger posting pages are recorded in the column marked "Fo." meaning "folio."

Preventing and Finding Errors.—In the making of entries in books of original entry, in adding columns, in posting, in finding balances of accounts and in listing balances in the trial balance, opportunities for making errors arise. Such errors are usually not discovered until the addition of the two columns of the trial balance indicates that it is off. Looking for errors is one of the most tedious processes in bookkeeping. A study of methods that will reduce the number of errors or assist in finding them is an important part of the study of bookkeeping. Obviously, it is much better to reduce the number of errors if possible. Experience has taught, however, that it is the exceptional bookkeeper who can avoid errors. Accordingly it is advisable also to know what to do when errors exist.

Precautions for Preventing Errors.—The following precautions are suggested for preventing errors:

1. *Keep your mind on your work.*
2. *Look at each amount twice, once while writing it and once immediately after writing it, as sort of a check against the amount from which it is recorded or posted.*
3. *Add each column of figures twice, once from the top down, and once from the bottom up.* The same result both ways is a reasonable proof of accuracy, since the combina-

tion of figures is not the same in running up and down the columns.

4. *Make sure that every item is placed in the proper column in the book of original entry, and that the debits and credits that you had in mind at the time of analyzing the transactions are the ones that are expressed in the book of original entry.* (An error caused by a failure to do this would not be revealed in the trial balance.)

5. *Post all the debits first for the period and then post all the credits.* This will tend to avoid posting to the wrong side of an account.

6. *Before posting, see that the debits equal the credits in the books of original entry.* In the simple cash book this would hardly apply, except to the check afforded by adding the columns, for one amount expresses both the debit and credit of a transaction. In the simple journal a scrutiny of the debit and credit amounts would suffice, but in the cash journal it should be seen that the sum total of the debit columns agrees with the sum total of the credit columns.

7. *Exercise great care in finding the balances of the accounts and in listing them in the trial balance.*

8. *Verify the cash occasionally to see that the amount under your control is equal to the amount that the cash book or cash journal indicates you should have.* If it is off it might lead you to recall some instance of cash received or paid that had not been entered, or it might lead to the discovery of a cash item entered in the cash book for the wrong amount.

Common Types of Errors.—Errors are classified in order to assist in establishing a methodical way of finding them. The following list indicates the types of errors made most often: Addition in books of original entry, posting wrong amount, omission of posting, posting same item twice, posting to the wrong side of an account, trans-

position of figures, transplacement of figures, carrying totals or balances forward from one page to another, bringing down balances, closing accounts, footing the ledger accounts, calculating the balances of the ledger accounts, listing wrong amount in trial balance, entering on the wrong side of the trial balance.

Rules for Finding Errors.—In order to find errors with the least time and effort one must be familiar with the types of errors and the methods of preventing them. The finding, then, resolves itself into a systematic review of the work where errors are most likely to exist. The following order of procedure is regarded as the one that will result in the finding of errors in the least time:

1. *Find the amount of the error by calculating the difference between the two totals of the trial balance.*

2. *If the difference is any number containing only the digit 1 and 0, or containing only the digit 9, the error is doubtless in addition or subtraction.* Thus in an error of \$1, \$10, 10 cents, 1 cent, 99 cents, \$9.99, etc., check over the additions and subtractions of ledger accounts, trial balance and special columns. An error of \$9.99 might be the result of an error of \$10 one way and 1 cent the other.

3. *If the difference is divisible by 2 (that is, if it is an even number) look for one-half the amount on the other side.* Thus, if the credit side of the trial balance exceeds the debit side by \$96 it might have been caused by placing a ledger debit balance of \$48 on the credit side of the trial balance. It might also have been caused by posting a debit of \$48 to the credit side of an account.

4. *If the difference is exactly divisible by 9 look for a transposition or transplacement of figures.* For example, if the error is \$27, perhaps \$63 has been written in place of \$36 or vice versa. It is always true that an error due to transposition is exactly divisible by 9. Thus the difference

between 52 and 25 is 27; between 53 and 35 is 18. This is an easy way to find errors if one is familiar with its use, but care should be taken lest time be wasted in a juggling of figures.

This is also true of transplacement of figures, which is likewise distinguished by the fact that the amount of the error is divisible by 9. Suppose that \$630 has been posted as \$6.30, making an error of \$623.70, which is divisible by 9 and evidently a transplacement. To find the amount transplaced subtract the cents of the error from 100, as

From	100
Deduct the cents of the error	70
	<hr/>
Leaving a balance of	30

Now look in the cents column for 30, which will result in finding the \$6.30. Upon investigation it will be found that the entry should have been \$630. Suppose that \$4.45 has been posted as \$445, giving an error of \$440.55, the same rule will apply; 55 deducted from 100 gives 45, which is the amount to be looked for in the last dollar columns.

5. *If the difference is a large amount, no matter whether Rules 2, 3 and 4 can be applied or not it is always desirable to look for the amount omitted. One's memory will often serve him in this connection.*

6. *If none of the tests mentioned can be readily applied begin a systematic checking of all the postings and additions, bearing in mind the points mentioned under the prevention of errors. In checking postings a check mark similar to a "V" is placed opposite each amount in the books of original entry and in the ledger as the amounts are found to be properly posted. After the checking is completed, a careful scrutiny of all items follows to find*

any items in either book that have not been checked against items in the other.

Correcting Errors.—Too much emphasis cannot be placed upon the importance of correcting errors after they have been found. The author knows of several instances in which bookkeepers, off in their trial balances, have found the errors, corrected the totals in the trial balances and said, "now it's all right." At the next time of taking a trial balance they had a most trying time. It was found, after some difficulties, that they had not corrected the previously existing errors in the ledger accounts. They had proceeded, however, on the assumption that everything was correct down through the preceding trial balance. Such errors carried over from a preceding period have caused many otherwise good bookkeepers to spend almost sleepless nights looking for errors in the present period, while they really existed in the preceding period.

If the error in question is found as a result of taking the trial balance before closing, failure to correct it after discovery can be found by taking a trial balance after closing. Errors in trial balances after closing usually arise in carrying down balances in the ledger and are quite easily found. The mechanical process of correcting errors consists chiefly in crossing out the wrong figures with a single line and writing the correct ones above them or in the proper place (perhaps on the opposite side of an account).

Some errors do not affect the trial balance. These, if found at all, usually require special treatment. If a transaction is omitted entirely, enter it on the next unused line in the book of original entry and make a note that it should have been entered on a certain other date. If an item is posted to the correct side of the ledger but to the wrong account make an entry in the journal to correct it. All adjustments, corrections and transfers should be

made through the journal when more than one account is involved. Thus, if an item of \$150 were posted to the debit side of Cattle account, instead of the debit side of Horses account, the correcting entry in the journal or cash journal should express a debit to Horses account and a credit to Cattle account of \$150.

Finding Errors in the Cash Balance.—Mention was made above to the fact that the cash balance should be verified occasionally. This means that an effort should be made to determine that the amount of cash as shown by the cash book, cash journal or Cash account is equal to the amount under one's control. The Cash account balance, after posting, should equal the amount of cash in the checking account at the bank, plus the amount in one's purse, plus the amount anywhere about the premises.

The calculation made in verifying the cash balance usually assumes this form:

Balance in "X" Bank, checking account June 30, 1916, per check stub.....	\$1,380
Cash on premises.....	13
	<hr/>
Balance in my possession per Cash account, June 30, 1916..	\$1,393
(See Illustration 23) { Dr. \$3,284	<hr/>
{ Cr. 1,891	<hr/>
	\$1,393
	<hr/>

Reconciling the Checking Account.—In speaking of a checking account, one does not imply that there is an account in the ledger called "checking account." He means merely the record kept on the premises usually in the form of check stubs to show from time to time how much is left in the bank available for use. The balance on the check stubs on a given date presumably shows the

amount for which one may issue checks before entirely exhausting the amount on deposit. However, it cannot be stated positively that one has the right to withdraw an amount equal to the balance of the check stubs.

Errors are made sometimes which cause the check stubs to show an untrue state of affairs. It is for this reason that the balance shown by the check stubs should be verified occasionally with the balance shown by the books of the bank. This verification consists of three main steps:

1. The finding of the balance shown by the bank's books.
2. The comparing of the bank's figure with the figure shown by the check stubs.
3. Accounting for the difference between the two figures when a difference exists.

The first of the steps mentioned above, the finding of the balance as shown by the books of the bank, is usually accomplished by getting the bank pass book balanced. This procedure results in the bank's recording the balance in the pass book, and returning all checks "cashed" up to the day of balancing.

The second step, comparing the bank pass book balance with the check stub balance, involves a simple comparison of figures. If the two amounts agree the third step in the verification of the check stub figure is unnecessary.

The third step, accounting for the difference between the pass book and the check stub figures, if one exists, is the one called "Reconciling the checking account." It usually consists in preparing a bank reconciliation statement in the form shown in Illustration 24. Such statement is usually prepared on the back of the last check stub used up to the time of reconciliation.

This bank reconciliation statement is typical of the average one prepared on the farm. It shows the element or elements that cause the difference between the bank pass book balance and the check stub balance. Such dif-

ference is usually caused only by the fact that some of the checks issued have not been presented at the bank. The amount of a check is deducted from the check stub balance as soon as issued. It is deducted from the balance on the bank's books only when the check reaches the bank, often several days later. As a result it is quite common on any given date to find a difference between the amount the bank shows as being on deposit, and the amount the check stubs show. The amount that should be used in verifying the Cash account is the check stub balance, since it shows how much more one may draw out of the bank. The bank's figure is usually larger than the check stub balance but it is subject to a deduction at any time when some outstanding check is presented.

ILLUSTRATION 24

BANK RECONCILIATION STATEMENT

Balance per bank pass book, June 30, 1916.....	\$1,415
Less checks outstanding,	
No. 201 (for example) payable to Jas. Brown	
issued June 30, 1916.....	35
	<hr/>
Balance per check stubs, June 30, 1916.....	\$1,380
	<hr/> <hr/>

Illustration 24 shows a check outstanding for \$35 issued on June 30, 1916, to Jas. Brown, meaning that the latter has not presented it at the bank for payment. By referring to Illustration 18, 20 or 22 it is seen that Mr. Brown was paid \$35 for labor. Such payment is recorded on the check stubs and in the cash book or cash journal at the time of issue. Hence the check stub balance is decreased by that amount. In this case it leaves the check stub balance \$1380, which is the amount used in the calculation on page 108 in verifying the balance of the Cash account.

Errors on Check Stubs.—It happens occasionally that

some differences arise between the check stubs and the bank pass book that cannot be accounted for by outstanding checks. Such differences are usually caused by an error in adding or subtracting amounts on the check stubs. The procedure in finding such errors may be described briefly as consisting of sorting the checks in numerical or date order, comparing the amounts on the checks with the amounts on the check stubs, and verifying all additions and subtractions on the check stubs. Before completing this part of the work, it is always desirable also to compare each deposit recorded in the bank pass book with the several deposits recorded on the check stubs. The steps just enumerated in this paragraph should be sufficient to find all differences between the balance shown by the check stubs and the bank's balance, whether such differences be caused by outstanding checks, errors in addition or subtraction, omission of a check or wrong entry on the check stubs.

Any errors found on the check stubs should be corrected immediately and carried through to the last balance in current use. If the error is the entering of a check for the wrong amount, such error will require correction in the cash journal and in the ledger accounts, if posting has been done. If it is impossible to verify the cash balance after getting the checking account reconciled, it usually means that some currency has been paid out or received without being entered in the cash journal. When the amount of such difference is determined, an entry should be made in the cash journal debiting General Expense and crediting Cash, if the cash is "short," or debiting Cash and crediting Miscellaneous Income if the cash is "over." Cash is said to be "short" when the balance on hand and in the bank is less than the Cash account balance.

In summary, then, it may be said that the balance per

the Cash account is made up of the balance per check stubs plus cash on the premises. The balance per check stubs is verified by comparing it with the balance per the bank pass book. If the only difference between the pass book balance and the check stub balance is caused by checks outstanding, no further steps in the verification are necessary. If some of the difference is caused by errors on the check stubs, such errors should be traced into the book of original entry and ledger and all corrections made.

ILLUSTRATIVE PROBLEMS

1. Using the transactions of Frank Rodgers given under Illustrative Problem 2 of Chapter IV,

- (a) make journal entries,
- (b) post them to the ledger,¹
- (c) take a trial balance at the close of the year,
- (d) perform similar operations using the transactions of problem 3, Chapter IV, posting to the same ledger accounts used in (b) above when possible.

2. With the same sets of transactions

(a) make cash book entries for all cash transactions, and simple journal entries for the others.

- (b) post to the ledger,¹
- (c) take a trial balance at the close of each year. Complete the cash book entries, posting and trial balance of transactions of problem 2, Chapter IV, before beginning entries for transactions of problem 3, Chapter IV.

3. Using the same transactions again,

- (a) make entries in a cash journal,
- (b) post them,¹
- (c) take a trial balance at the close of each year. As in prob-

¹ Obviously, the ledgers in problems 1, 2 and 3 of Illustrative Problems, Chapter V, are not to be the same ones used in the problems referred to in Chapter IV. They are to be different ledgers; but are to be used for comparison after they are finished.

lem 2 above, complete the trial balance for the first year before beginning the entry of the second year's transactions of Mr. Rodgers. The money columns in the cash journal are to bear the headings, Labor Dr., Cash Dr., Sundry Dr., Sundry Cr., Cash Cr., and Poultry Cr.

4. Prepare for an oral discussion on the comparative results of problems 1, 2, and 3 above, and the effect of the three methods

(a) on the appearance of the ledger accounts,

(b) the net results of the ledger accounts, and (c) on the trial balance.

(d) Also compare the ledger accounts and trial balances with those constructed from the same set of transactions when the latter were placed directly into the ledger accounts as in problems 2 and 3 of Chapter IV.

5. On Sept. 30, 1917, A. E. Long verifies his cash and reconciles his checking account. He totals the cash columns of the Cash journal in pencil to date and records a debit total of \$2160.38, which includes the balance at the beginning of the year; and records a credit total of \$1328.48. His check stubs show a balance of \$820.31 and he counts \$11.59 in his pocket-book. The bank pass book was balanced on Sept. 30, 1917, showing a balance of \$851.69. In comparing the canceled checks returned by the bank with the check stubs, it is found that check No. 198 for \$25 and check No. 201 for \$6.38 issued to T. Somers and John Walters, respectively have not been "cashed" by the bank.

You are asked to reproduce the statement verifying the cash balance in accordance with the facts stated above; and also to show the bank reconciliation statement.

6. This problem is to be worked, considering the statements of problem 5 above, if necessary.

On Dec. 31, 1917, A. E. Long again verifies his cash and reconciles his checking account. It is the first time his bank book has been balanced since Sept. 30, as stated in problem 5 above. The cash journal on Dec. 31 shows a debit total of \$3520.17 after including the balance carried into the explanation column on Oct. 1, and a credit total of \$2117.17. All checks and items deposited have been entered in the cash journal ex-

actly as they were recorded on the check stubs. Cash in Mr. Long's pocketbook on Dec. 31, is \$5.70. During the three months, Sept. 30 to Dec. 31, 1917, \$11.46 cash had been received and recorded as such in the cash journal, that was not deposited in the bank. Also, \$17.15 was recorded in the cash journal as having been paid aside from the checks issued bearing numbers 202 to 208 inclusive.

The stubs of A. E. Long's check book show the following facts and figures:

Balance check stubs, Sept. 30, 1917	\$820.31
Oct. 2 check #202 for general expense	37.19
	<hr/>
	\$783.12
Oct. 8 check #203 for equipment	85.00
	<hr/>
	\$698.12
Oct. 15 deposit (X Elevator Co. for corn)	980.00
	<hr/>
	\$1,678.12
Nov. 3 check #204 for labor, T. Somers	20.00
	<hr/>
	\$1,658.12
Nov. 15 check #205 for labor (sundry)	30.16
	<hr/>
	\$1,627.96
Nov. 21 check #206 for cattle	540.00
	<hr/>
	\$1,087.96
Nov. 30 check #207 for general expense	39.19
	<hr/>
	\$1,048.77
Dec. 14 deposit (sale of hogs)	185.00
	<hr/>
	\$1,223.77
Dec. 22 deposit (sale of oats)	183.33
	<hr/>
	\$1,407.10
Dec. 30 check #208 for labor, T. Somers	20.00
	<hr/>
Balance, check stubs Dec. 31, 1917	\$1,387.10

In comparing the several amounts on the check stubs with the bank pass book, it is found that the three deposits of \$980, \$185 and \$183.33 correspond exactly with the deposits shown in the bank pass book for the three months.

The checks returned by the bank are sorted out in numerical order and are found to bear the following numbers and amounts:

Check No.	Amount
198	\$25.00
202	37.19
203	85.00
204	20.00
205	30.16
206	540.00
207	93.19

The pass book balance is \$1369.48 on Dec. 31, 1917.

(a) Prepare a statement verifying the cash balance as calculated from the cash journal figures of Dec. 31, 1917. (There is a small amount which he cannot account for. Perhaps he lost it.)

(b) Prepare a bank reconciliation statement as of Dec. 31, 1917.

(c) Explain any differences or irregularities arising in the statements prepared under (a) and (b) above.

(d) Indicate, in the proper ways, all corrections necessary to make A. E. Long's books and records correct and ready for further transactions.

REVIEW QUESTIONS

1. If only one book of record were to be used what one would it be?
2. If only one book of original entry were to be used what one would it be?
3. Name five reasons for not using the ledger alone, in commercial accounting.
4. To what extent do these reasons apply to farm accounting?

5. How does the use of books of original entry tend to prevent or assist in finding errors? How does it tend to cause errors?
6. What is the purpose of books of original entry?
7. What information should be recorded in books of original entry?
8. What is posting?
9. What are four of the most common books of original entry?
10. Which ones are considered practical in farm accounting? Why?
11. What is the nature of the simple journal?
12. In what form are journal entries made?
13. In posting from the journal what method is followed?
14. Are there as many or more items in the ledger when it is prepared from the journal as when it is prepared from the transactions direct? Why?
15. Describe the form of the simple cash book.
16. What debits and credits are expressed on the left hand side? On the right hand side?
17. Can the cash book be used as the only book of original entry in a business? Discuss.
18. What general principle is followed in posting from the cash book?
19. Why is the cash journal practical for use on a farm?
20. What are some of the distinguishing characteristics of the cash journal?
21. Are all cash journals alike? Discuss.
22. What columns are always found in a cash journal? Why?
23. Describe the method of expressing debits and credits in a cash journal.
24. Describe the method of determining whether there have been debits and credits of equal amount entered.
25. Describe the process of posting from the cash journal.
26. Describe optional forms of cash journals.
27. Discuss the relative merits of the simple journal, cash book and cash journal, with respect to their effects upon the ledger.

28. Why should a bookkeeper know something about preventing and finding errors?
29. Suggest several ways of preventing errors in books of account.
30. What are some of the most common classes of errors?
31. How should one proceed systematically to locate errors?
32. Discuss errors in addition, transposition and transplacement.
33. Why is it important that errors be corrected when they are found?
34. Suggest a way of correcting
 - (a) an item posted to the wrong account,
 - (b) one posted for the wrong amount,
 - (c) one posted to the wrong side of the account,
 - (d) a transaction omitted from the books.
35. How is the balance of Cash account verified?
36. What is meant by reconciling the checking account?
37. What general form does a bank reconciliation statement assume?
38. What is an outstanding check?
39. Describe the detailed procedure in locating the difference between the check stub balance and the bank balance.
40. If it is found that a check in payment of Jas. Brown's wages was issued for \$35, but entered on the check stubs and in the cash journal as \$25, what corrections are necessary?

CHAPTER VI

SPECIAL ACCOUNTS AND ENTRIES

In illustrating the principles of the financial statements, the ledger and books of original entry, only a limited variety of farm transactions have been used. Having a working knowledge of a few principles of debits and credits as already presented, one could make entries for almost any transaction that might arise. The principal difficulty in doing this would lie in understanding the exact nature of the transactions, and in knowing what the customary titles of some of the special accounts are.

Without entering the field of farm cost accounting as yet, there is quite an important group of transactions that require special consideration. Also, some of the accounts already discussed need further elaboration.

Hired Man.—When a hired man is employed regularly for a year or the greater part thereof, at a certain wage per month or week, he is quite often paid small amounts from time to time, without drawing his full amount at the close of each working period. In such cases, a personal account is opened with the hired man, bearing his name. At the close of each month or week his account is credited with the agreed wage, and labor account is debited. When any payment is made to him, his personal account is debited and Cash is credited. The balance of his account will then show at any time just how much is owing to him, provided all postings have been made. These entries are in accordance with a rule for debiting and crediting accounts of individuals, firms or corporations. The hired man gives his services, which are val-

uable, so the farmer credits him. That shows as a credit balance in the hired man's account, increasing the liabilities of the business. Accordingly, capital is decreased, since liabilities increase without a corresponding increase of resources. This decrease in capital is shown by the debit to the nominal account Labor, which is a subdivision of the capital account as presented in Chapter III.

Notes Receivable.—This account is governed largely by the general principles regulating debits and credits to property accounts, namely, debit when received, credit when parted with. It includes all negotiable instruments other than checks, bank drafts, and money orders received into the business. From the principles governing the account, it is obvious that it should always have a debit balance, if any; and that a credit entry should not be made indicating the giving out of a note unless an entry has previously been made indicating the receipt of the same note. Credit entries usually indicate that the note was given out upon the receipt of cash from the maker. It is proper, however, to credit the account when the note is given out for any reason. If, for example, it is endorsed over to Mr. A in settlement of a debt, Notes Receivable account is credited and Mr. A's account debited. If it is discounted at the bank, Notes Receivable account is credited for the face of the note and Cash debited for the amount of cash, and Interest or General Expense debited for the discount deducted, thus:

Cash.....	\$98
Interest.....	2
Notes Receivable.....	\$100

This entry indicates that a note whose face value is \$100, previously received from someone else, has been discounted, \$2 being deducted by the bank for discount. In commercial accounting it is considered better in this spe-

cific case to credit "Notes Receivable Discounted" account until the maturity of the note. This is not considered necessary in farm accounting.

In all cases it should be noted that Notes Receivable account is debited or credited for the face of the note, except that credits for less than the face may be made if payments are made on the installment plan. Interest on notes is never entered in the Notes Receivable account. Any balance in the Notes Receivable account is a resource.

Notes Payable.—The principles just stated concerning face value and interest of Notes Receivable apply also to Notes Payable, except that the partial payments of the note are debited to the Notes Payable account, instead of being credited.

Notes Payable account is credited when we give our note to someone else, or when we give out any negotiable instrument on which we are primarily liable as maker or acceptor. It is debited when the instrument is paid by us or returned to us for some other reason. Any balance in Notes Payable account is a liability.

Notes Receivable and Payable Distinguished.—Both in case of Notes Receivable and Notes Payable accounts a credit entry is made when a negotiable instrument is parted with by the business. For that reason it is difficult for some to determine whether to credit Notes Receivable or Notes Payable in any given case. The test should always be, "Who is primarily liable on the instrument?" If we are primarily liable, credit Notes Payable, thus creating a Liability. If someone else is primarily liable, credit Notes Receivable. Another test is also helpful. *Notes Payable account is always credited with the face of a note before it is debited; Notes Receivable is always debited before it is credited. Notes Payable always has a credit balance if any. Notes Receivable always has a debit balance if any.*

The same principles govern mortgage notes. The latter are sometimes shown under separate accounts because of the nature of the security accompanying the notes rather than because of any material difference in the negotiable instruments themselves.

Checks, bank drafts and money orders are considered as cash, and are so entered when received or given.

Land and Buildings.—This account is sometimes used to record transactions concerning land and buildings.

In farm accounting, as in most kinds of commercial accounting, it is better to keep two accounts, one for land and one for buildings. These may be subdivided to care for different parcels of land or different buildings.

Land.—Land account is debited with the original cost of the land, if accounts are being kept at the time of purchase. If books of account are opened after land is in one's possession, debit the account with a fair market value of the land at the time of opening the books. Land inherited after the books of account are opened is charged to the account at a fair market value at the time of inheritance.

The account is also charged with any special assessments levied (usually applying to city rather than rural property), with any recording costs, attorney's fees or other necessary expense up to the time title passes to the purchaser. It is charged with cost of clearing, minus income from timber;¹ with the cost of any permanent improvements as tiling, fencing, or dredging, except that annual or periodical dredging in a stream should be charged to General Expense. A new fence or "stretch" of tiling to replace parts worn out should also be charged to General

¹ This does not mean that the cost of operating a lumber camp is charged to Land account. It refers only to clearing on a small scale, except that removal of stumps from a large deforested area would be charged to land.

Expense, except that in cost accounting, tile repairs are charged to the field. However, if the new fence is more substantial and valuable than the original, or if the new tiling is larger, replacing an inadequate size, Land account may be charged with part of the cost. It may be charged with that part represented by the excess cost of the new fence or tiling over the present cost to construct a fence or lay tile of the type of the old ones. The remainder of the cost is charged to General Expense, unless a general repair account is kept, or cost records enable a specific field to be charged.

Land account should not be charged with any amount to represent increase in value, commonly called appreciation. To do so would be figuring something as a profit that had not been earned. Land, except through crops, does not make a profit until it is sold. If it were debited with the increase in value the Loss and Gain account would be credited. This would inflate the profits for the year. If fluctuations in land are to be recorded on the books, decreases in value should be recorded also. If bad crops caused land to decrease in value, the next year, an entry should be made, debiting Loss and Gain and crediting Land to show the decrease in value of property. This would be a fictitious loss for the year in addition to the actual loss incurred because of poor crops.

As long as land is held primarily for agricultural purposes, no loss or gain should be recorded in the books until it is sold. If it is sold for more than the book value, the result is a gain; if for less, it is a loss. For illustration, if the book value of a piece of land is \$8000 and it is sold for \$10,000 cash, the entry for the sale is:

Cash.....	\$10,000	
Land.....		\$8,000
Loss and Gain.....		2,000

If it is sold for \$7000 the entry is:

Cash.....	\$7,000	
Loss and Gain.....	1,000	
Land.....		\$8,000

If one-half of the area is sold for \$5000, assuming it is of uniform value, the entry is:

Cash.....	\$5,000	
Land.....		\$4,000
Loss and Gain.....		1,000

This leaves the Land account with a debit balance of \$4000, representing the book value of the half remaining unsold. The profit of \$1000 is made on the part sold.

Buildings.—Buildings account is debited with the cost of buildings at the time of erection, the appraised value at time of opening books or at time of inheritance in accordance with the principles stated for Land account. The same principles also apply for repairs, additions and replacements, and for sale of structures.

The principal points of difference between Land and Building accounts are appreciation and depreciation. The question of appreciation seldom, if ever, arises in connection with buildings. The matter of depreciation, however, does arise. That is the principal reason for keeping land and buildings under separate accounts.

Depreciation is discussed under separate title later in this chapter. Building depreciation is taken up there briefly, although it does not call for much special comment. It should be stated, however, that the common statement so often made in connection with farm records, that "depreciation of buildings is offset by appreciation in land" is not upheld by scientific principles of accounting.

Mixed Accounts in a Trading Business.—The class of

accounts known as mixed accounts has received much justified criticism when used in commercial accounting. The most prominent account of this nature in trading concerns is merchandise. It is called a mixed account, because it does not come under any of the other classes, but is a combination of several. It does not show a resource, an expense or an income exclusively, but contains entries representing resources, expenses and incomes all together. The Merchandise account is debited with the value of the goods on hand at the beginning of the period, with the cost of goods purchased, with freight and drayage on goods purchased, and is credited with the selling price of goods and with the inventory of goods on hand at the close of the period. Any purchases or sales returned are also credited or debited respectively to the merchandise account. After making entries as noted, any credit balance remaining in the account indicates a gross profit, any debit balance represents a gross loss.

The criticism of the account is based on the fact that it must be analyzed in order to show correct results. The total credits cannot be taken as sales, for some of the credits are usually for purchases returned at cost price. Likewise the total debits do not usually show the purchases because some of the debits are at sale price representing returned sales.

In place of the Merchandise account several accounts are used as subdivisions of the account as follows: Purchases, Sales, Returned Purchases, Returned Sales, Inventory, Freight and Drayage-In. At the close of a fiscal period these several account balances are brought together into a Trading account to find the net result.

Mixed Accounts on the Farm.—*In farm accounting the mixed account cannot be condemned to the extent that it is in commercial accounting for four reasons. (a) The work of keeping extra accounts in place of the mixed ac-*

count does not warrant their use, since an analysis of the mixed accounts on the farm is not as essential and the entries in any one account are so few in number. (b) The kinds of commodities requiring mixed accounts on the farm are more numerous than in the average trading business, and represent departments of farming operations, the main object of which is to find the profit or loss in each. (c) There is seldom occasion in farming transactions to record returned commodities. Consequently the mixed accounts on the farm almost invariably contain, aside from inventories, only items at cost price on the debit side, and at selling price on the credit side. (d) In case of farm animals there are additions due to the natural increase which are not taken into account, except through the inventory at the close of the fiscal period. The mixed account affords the best way of accounting for the natural increase.

The most common mixed accounts on the farm are those representing the commodities from which an income is derived, as the livestock accounts and grain accounts. The equipment used in production is also recorded in mixed accounts sometimes, but it is better not to keep the expenses and incomes from this class of resource in the resource account. This is especially true in cost accounting.

Horses.—On the average farm where the primary object of keeping horses is to assist in the farm work, Horses account is debited with the inventory value of horses on hand at the beginning of the fiscal period and with any expenses incurred on their behalf during the period. It is credited with any income from the use or sale of horses and with the inventory value of all horses on hand at the close of the year. The balance represents a loss or gain for the year.

In cost accounting it is advisable to keep separate accounts for work horses and other horses, if any general

attempt is made to raise horses for the market. If a horse or colt is sold only occasionally, it should be considered as an income arising because of the general plan to keep enough horses on hand to perform the work economically. That is, the occasional sale would not require an account for other horses.

Swine.—The Swine account is charged with the inventory value of all swine on hand at the beginning of the year and with all expenses incurred on their behalf. It is credited with the selling price of all swine sold and with the farm value of all swine slaughtered for consumption by the farmer's household. At the close of the fiscal year it is credited with the inventory value of all swine on hand. The balance of the account then shows the loss or gain as a result of raising swine.

Cattle.—An account with Cattle is kept when it is desired to find out how much is being made or lost as a result of keeping cattle on the farm.

If one engages in dairy farming and also in beef cattle raising, it is better to keep a record of the results of each class separate. For this purpose, two accounts called Dairy Cattle and Beef Cattle respectively are maintained, each to show the results of its specific class.

It is not advisable to keep the two accounts if one of the lines mentioned is entirely subsidiary. That is, if the main cattle industry on a farm is that of dairying, but a few steers or heifers are sold in the market each year, it is not necessary to keep an account with beef cattle. Such sales are considered as an essential part of the main purpose of keeping the dairy herd up to standard. Likewise, if the main cattle industry is that of feeding for market, but one or two cows are kept for dairy purposes, only the Beef Cattle account is required.

Cattle account is one of the several accounts, needed in a farm ledger, which are of a peculiar type, from an ac-

counting point of view. It must record sales of the resource itself and sales of the product. It is impossible to keep accurate, separate cost accounts of the cattle as livestock and of the products of the cattle as milk, cream and butter. The difficulty from a cost accounting viewpoint lies in the fact that the costs cannot be divided accurately. When feed is given to a dairy cow it is quite impossible for the farmer to state what proportion of the value of the feed contributes to the cost of the dairy products and what proportion to the up-keep of the animal.

If one is in the dairy business selling products and also selling pure bred dairy cattle, it is advisable to keep an account called Dairy Products, and one called Dairy Cattle. Under such conditions the Dairy Products account is credited with all income from the sale of dairy products to outsiders or to the household, and is debited with the costs of producing and marketing the products. The Dairy Cattle account would contain entries for the inventory at the beginning and close of the period. It would be debited with all costs of up-keep of the herd and credited with all income from sale of members of the herd.

At the close of the year the Dairy Products account is closed into the Dairy Cattle account. After crediting the Cattle account with the inventory value of animals on hand at the close of the year, any balance is transferred to Loss and Gain account.

Poultry.—As suggested in connection with the Dairy Cattle and Dairy Products accounts outlined above, Poultry account presents the twofold results of the income from sale of property and the income from sale of product, without any basis for dividing the expenses. That is, in cost accounting it is difficult, or rather, impossible to determine how much of the feed consumed by chickens is to be charged against the eggs and how much against the poultry, if two accounts are kept. Accordingly, if two

accounts are kept, it merely assists in finding the income from eggs throughout the year as a separate item to be transferred to the credit of Poultry account at the close of the year. The net profit on eggs cannot be found separately from the net profit on poultry except through the use of estimates or averages. The net profit from the *handling* of eggs can be found if the Eggs account is charged with all costs in connection with them after they are laid; and credited with the selling price of those sold and used.

However, for all practical purposes, one account with poultry is sufficient unless it is desired to keep the Eggs account merely for the purpose of crediting it with the income, which is transferred to Poultry account at the close of the year. After crediting Poultry account with the inventory value of fowls on hand at the close of the year, any balance remaining is transferred to Loss and Gain account.

Sheep.—Sheep account is another of the mixed accounts to which the same principles apply as have been brought out in connection with cattle and poultry. In this case, however, there is not as good a reason for keeping a separate account for wool as there is for dairy products and eggs, since the sales of this product do not require as many entries in the course of a year. It would be a very easy matter to pick out from the credit side of Sheep account the item or items representing sales of wool, if one wished to find out at the close of the year how much of the total income was due to the sale of sheep and how much to the sale of wool.

Equipment.—The title "Equipment" is used to designate the account with farm implements and tools of various sorts.

Some writers on the subject advocate the separation of Equipment account into several classes, depending upon

the use made of the various equipment units. For example, there might be hay machinery, corn machinery, grain machinery, etc. This separation is suggested by some in cost accounting systems in order to facilitate the charge to the various crops for machinery depreciation. It has been found by experiment that a better and easier method exists. This method is presented in Chapter IX on cost accounting.

A separate account for the Farm Tractor may be kept if one wants to find out its cost of operation without much analysis at the close of the year. Likewise, any special machines as hay balers, corn shredders and threshing machine outfits may have special accounts of a mixed nature to show the income, expenses and inventory values of each special type of such machinery. Such accounts would be operated in the same way as any other mixed accounts, being debited with beginning inventory and expenses and credited with income and closing inventory. The net gain or loss would be transferred to Loss and Gain account.

Farm Crops.—There is no account called “farm crops,” but the title is used as a basis for discussing grain and forage accounts in general. There is no distinguishing characteristic that requires one of this class of accounts to be treated in a different manner from the others.

A crop account is debited with the inventory at the beginning of the period and with expenses incurred, and is credited with the sale of the commodities, and the inventory, at the close of the year. In cost accounting it is debited with all ascertainable costs of production up to time of harvest, as transferred from the field account; and with all subsequent costs in connection with the specific crop, and is credited with the value of feed sold and that consumed on the farm by livestock or in the household. When a cost system is not used, any balance remaining in a crop account, after crediting it with the inventory at

the close of the period, is transferred to Loss and Gain account.

Household.—The Household account is one of the first ones that should be established in any system of farm accounts. This does not necessarily mean that it is the first one to be studied. This account contains all transactions involving the personal affairs of the farmer and his family as opposed to the other accounts which relate to his operations as a farmer.

Household account has no parallel in commercial accounting. It might arise in commercial accounting, if the doctor, the lawyer, or the merchant recorded his expenses for groceries, clothes, amusements and similar items among his business expenses. In case of the doctor, he records his expenses and fees in a set of books at the office. At the close of the year he finds from the Loss and Gain account how much he has made as a doctor. If it is \$50,000, for example, it is considered that he has made a success in his profession.

Had the doctor recorded all expenses of maintaining his house in the set of books at the office, results might have been different. For example, suppose his family had lots of clothes, entertained lavishly and took vacations at a fashionable summer or winter resort, as a result of which the Loss and Gain account of the doctor's office books showed a loss of \$1000 at the close of the year. It might lead to false conclusions if one did not stop to analyze the situation.

It might lead to the conclusion that he was not a successful physician. The facts, when known, however, are that he was a good physician, from a business point of view at least; but the standard of living of his family did not permit him as an individual to be any better off at the close of the year than at the beginning, in spite of his earnings in his profession.

The physician can easily avoid that apparent misrepresentation of his books, by keeping two sets of books, one at the office, and one at the house.

The farmer, however, finds this to be very impractical if not impossible. The household is so near to the business, in his case, and the activities are so interwoven that it is almost forgotten that the farm is, in a business sense at least, separate from the house to which the man goes after finishing his day's work.

However nearly related the household and farm may be, it is necessary to keep the records of the farmer in such a way that it can be easily determined what his profit is from the farming business and what it is as an individual.

For this purpose, the Household account is one of the accounts that should always be found in the farm ledger. In it are recorded all transactions of the household with the farm proper or with outside parties. In fact it is considered that all property in the beginning belongs to the farm with the exception of household furnishings and utensils. At any time subsequently the Household is debited for what it uses of the farm's resources or services and is credited for the value of its resources or services used by the farm.

Briefly, the Household is debited for everything bought for its use, and for everything contributed to it by the farm in the way of livestock and their products, grain, fuel or other commodities. It is credited for any services given to the farm by members of the household. This includes the time of the owner of the farm or any of his family and the board and lodging of hired help.

In the closing process at the end of the fiscal year, the Household account is credited with the inventory value¹ of household and personal belongings on hand. Such inventory includes all house furnishings, utensils, jewelry,

¹ See Appendix A, Pricing Inventories.

books and other articles not subject to immediate consumption, that are chargeable to the Household at the time of purchase. The house itself is not included in the inventory of household property. It is considered as part of the farm property, for which the household is charged with rent or interest.

It has been found by investigation ¹ in 483 farm families in ten states scattered through the east, south and middle west that the farm contributed to the household annually products and utilities valued at the following average amounts per family per year: food \$261.35, fuel \$34.72, use of house (rent) \$125.10, a total of \$421.17 per family or \$91.97 per person. None of these items include articles of food or fuel purchased away from the farm.

Statistics obtained from the same 483 families show that the average cost of board per person was \$14.64 a month. This means that hired labor costs more than the cash paid for wages and that the household should be given credit for this additional amount representing board and lodging.

Labor.—As stated under the Hired Man's account, Labor account is debited with the weekly or monthly wage as soon as it is earned, the hired man being credited in an account bearing his name. It is an expense of operation as soon as the work is performed. It is not necessary to wait until cash is paid before debiting Labor account. In the case of irregular or transient help, Labor account is debited only when the cash is paid. It is unnecessary to keep personal accounts with hired help except those who work for a season or more.

Board of Laborers.—Labor account is also debited with the value of board and lodging contributed to the hired help by the household. It is most convenient to make an entry for such items at the close of each month.

The entry for labor performed by a hired man employed

¹ U. S. Department of Agriculture. Farmer's Bulletin 635.

regularly and receiving board and lodging might be made under either of two methods. Assume the contract with John Morningstar is for \$30 a month with board and lodging, the latter being valued at \$15 a month.

Method I

Labor.....	\$45	
John Morningstar...		\$30
Household.....		15

Method II

Labor.....	\$45	
John Morningstar...		\$45
John Morningstar.....	15	
Household.....		15

Method I interprets the transaction as meaning that the total cost of labor is \$45, and that a liability of \$30 to John Morningstar is to be created showing that that is all which is owing to him at the end of the month. He is really paid the other \$15 in installments of board and lodging by the household each day as he is earning it. Method II is quite similar to Method I, but it requires two entries, one to credit the hired man with the full amount that he earns during the month and the other one to show immediately that he has been paid \$15 of it by the household in the form of board and lodging. Either method shows the same net results. For that reason Method I is preferable on account of its simplicity.

Labor of the Farmer's Family.—The value of the labor of the proprietor and other members of the household should be charged to Labor account at a reasonable average rate at some time before closing it into Loss and Gain account or before distributing labor over the various farm accounts, as is done in cost accounting. The entry for such labor can be made in a lump sum at the close of the

year, crediting Household. If some of the boys of the family work for a stipulated amount which is considerably less than current prices for similar help, debit Labor and credit Cash or the Son's account as in case of a regular hired man, and then, at the close of the year, debit Labor and credit Household with enough to make his total labor charge equal to that of a hired man of equal ability. For example, if a 20-year-old son, Tom, works for his father for \$10 a month and board and lodging, the entry at the close of each month would be:

Labor.....	\$25.00	
Tom.....		\$10.00
Household.....		15.00

Then at the close of the year, when it is found that the average wage of hired men is \$30 a month with board and lodging, make this additional entry:

Labor.....	\$240.00	
Household.....		\$240.00

This entry is the result of the following calculations:

	<i>Per Mo.</i>		<i>Per Yr.</i>	
Average expense for hired labor, cash.....	\$30		\$360	
Average expense for hired labor, board and lodg.	\$15	45	180	\$540
	—		—	
Average expense of Tom's labor, cash.....	10		120	
Average expense of Tom's labor, board and lodg.	15	25	180	300
Value of Tom's labor not previously charged to	—		—	—
Labor, to be entered at the close of the year..				\$240

With this \$240 posted to the debit of Labor account, the latter will show the value of services put into the farm enterprises. That is what the Labor account should show, in order to arrive at costs that have a meaning.

Feed.—When feed of any kind is purchased for a specific class of livestock, the livestock account for which it is to be used is debited. If it is a feed that is used by several classes of livestock a “feed” account is debited, the balance of which is transferred to Loss and Gain account as a separate item.

In operating a cost system the Feed account is closed into the several livestock accounts at the close of the year, based on the relative amounts consumed as shown by the feed records.

For example, in the cost system, if the balance of Feed account at the close of the year, after crediting it with the inventory, but before closing, is \$160, of which \$80 worth was consumed by swine, \$20 by poultry, \$30 by cattle and \$30 by horses, the following entry would be made:

Swine.....	\$80.00	
Poultry.....	20.00	
Cattle.....	30.00	
Horses.....	30.00	
Feed.....		\$160.00

The inventory is brought down on the debit side below the double lines, as in any other account.

Fertilizer.—Commercial fertilizer purchased is charged to Fertilizer account, the balance of which is closed into Loss and Gain, after considering inventory, when detailed costs are not kept.

Under the cost accounting method, the several fields are charged with the respective amounts of fertilizer applied. In such a case, if all fertilizer is used before the close of the year, the account should be in balance. If it is not all used, the balance should agree with the value of the fertilizer on hand.

Inventories.—One of the most important elements in determining the resources or the loss or gain of a farm is the

inventory. An inventory is not the name of an account as used in farm accounting. It affects a great many accounts, however. *Primarily an inventory is a list of commodities in one's possession at a given time, together with the quantities and value of each. As ordinarily used in connection with accounts, inventory refers only to the total value of a given class of property.* For instance, in the discussion of Crop accounts, it was stated that "a Crop account is debited with the inventory at the beginning of the period." This means, for example, that from the inventory sheet containing an itemized list of all possessions, the total value of corn on hand is used as a basis for debiting Corn account at the beginning of the period.

Inventory Entries in Accounts.—The method of using the inventory in an account at the beginning and close of a year is shown in Illustration 25 by its application in a Swine account.

ILLUSTRATION 25

INVENTORY ENTRIES IN AN ACCOUNT SHOWING A GAIN

Swine

1916		1916	
Mar. 1 Inventory.....	\$400	Nov. 5 Cash.....	\$200
1917		1917	
Feb. 28 To Loss & Gain	400	Jan. 30 Cash.....	300
		Feb. 28 Inventory....	300
	<hr/>		<hr/>
	\$800		\$800
	<hr/>		<hr/>
1917			
Mar. 1 Inventory.....	300		

The entries in the Swine account of Illustration 25 are made as a result of the following transactions or transfers of value:

Mar. 1, 1916. The debit of \$400 indicates either a credit to Capital account at time of opening the books; or a credit to Swine account on the last day of the preceding year, if the account books were kept at that time.

Nov. 5, 1916. This credit of \$200 indicates that swine were sold for \$200 cash, the latter account being debited.

Jan. 30, 1917. This credit of \$300 resulted in a debit to Cash for the sale of swine.

Feb. 28, 1917. The \$300 credit for the inventory was made after taking the trial balance at the close of the year, but before preparing the Loss and Gain Statement or Statement of Resources and Liabilities. It was made as part of the process of closing the ledger. The debit to offset the credit is found below the double lines of the same account. It is dated Mar. 1, 1917. It is considered as being made the first instant of the new year and the credit as being made the last instant of the old year. The date does not have any material effect except that it is better to have the entries above the double lines bear a date within the limits of the old year; and those below the double lines bear a date within the limits of the new year. When books of original entry are used this is one of that class of entries that do not have to appear in a book of original entry first. The reason is that it is a debit and a credit to the same account.

The \$400 debit in Illustration 25, under Feb. 28, 1917, is made in order to transfer the net gain to the Loss and Gain account. This is the last entry made before ruling off the account and bringing down the inventory. The loss or gain is found by the same arithmetical process that is used when the inventory is not brought into consideration. In this case (Illustration 25) the sum of the two sales plus the inventory at the close of the period is \$800. By subtracting the \$400 debit entry of Mar. 1, 1916, it is found that the result of dealing in swine is \$400. This gain is

transferred to Loss and Gain account by debiting Swine account and crediting Loss and Gain. The credit entry in Loss and Gain account is not shown in Illustration 25.

Some question arises as to why the \$300 inventory at the close of the period is credited to the Swine account, and also debited. It might be considered as a sale to the next fiscal year. All sales of swine are credited to the account. Since it is desired to show the profit of each year separate, it is considered that the swine on hand at the close of the year are sold to next year's operations. This sale to the succeeding year, however, is not made at selling price. This explanation also justifies the debit to the Swine account below the double lines, with the value of the inventory. It is covered by the principle that a mixed account is debited with the cost of the property on hand at the beginning of the fiscal period. The year in which the swine are sold will then receive the profit.

Natural Increase in Livestock.—It is only through the inventory entries that the natural increase in livestock is recorded. It is not practical to record values for young livestock born from time to time in the way a merchant records values for merchandise bought. Such values are reflected in the books annually at the time of recording the inventory. Thus the young stock born during a given year has its effect on the Loss and Gain account and upon the specific livestock account in the inventory entry or in the entry for sales. In Illustration 25 any pigs born during the fiscal year are accounted for in one of two ways. If they are sold on the market they are included in the regular sale credits. If they are not sold on the market they are sold to the next year's operations, so to speak, and are, therefore, included in the inventory entry.

In order to present the inventory and loss and gain entries under other conditions, let it be assumed that cholera caused the death of a considerable number of swine during

the year so that instead of selling \$500 worth and having \$300 worth left at the close of the year, as in Illustration 25, the owner sold only \$200 worth and had \$100 worth at the close. Under these conditions there would be a loss, and the account would appear as in Illustration 26 after closing it and bringing down the inventory. The inventory entry is made in the same way whether the account shows a gain or a loss. When the account shows a loss, it is necessary to credit such account and debit Loss and Gain account.

ILLUSTRATION 26

INVENTORY ENTRIES IN AN ACCOUNT SHOWING A LOSS

Swine

1916		1916	
Mar. 1 Inventory	\$400	Nov. 5 Cash	\$200
		1917	
		Feb. 28 Inventory	100
		Feb. 28 Loss & Gain ..	100
	<hr/>		<hr/>
	\$400		\$400
	<hr/>		<hr/>
1917			
Mar. 1 Inventory	\$100		

If an account does not have any debit or credit entries after the inventory at the beginning of a given year, and if the physical inventory at the close of the year agrees with the balance of the account, no entry is necessary for the inventory. For example, if Horses account has a balance on Mar. 1, 1916, of \$1200 and at time of closing on Feb. 28, 1917, there are no other entries in the account, and the inventory of horses taken at that date is \$1200, the account is left exactly as it was. It shows the true condition of affairs and there is no loss or gain to transfer.

Taking and Recording the Inventory.—*The physical in-*

ventory (the process of counting and valuing) is taken and recorded on sheets of paper or in a permanent book at the close of the fiscal year. This is Feb. 28, in the middle west, Mar. 31 in some other localities, and Dec. 31 in some special types of agriculture, especially orchards and nurseries. However, under the new Income Tax regulations it is more convenient to have the fiscal year coincide with the calendar year.

It is a very good plan to record inventories in comparative form, having the names of the items written on the left side of the page, reserving the space to the right for several money columns, one for each year. In this way one has the figures for about five years at a time to compare, which comparison serves as quite a valuable source of information.

Another good feature of the inventory record in permanent or comparative form is that it presents a good excuse for "calling in" tools that have been loaned. If one sees listed in 1916, among the tools, "1 post hole digger," but sees a blank space in the column of the comparative inventory for 1917, indicating no such tool on hand, it often serves to refresh the memory, and results in a trip or phone call to the neighbor's farm to have the missing article returned "so as to straighten out the records at the close of the year." It serves much the same purpose as the merchant's appeal to his customers to "please remit so we can close our books for the year." If the customer does not remit the merchant closes his books anyway. If the post hole digger is not returned, it is counted in anyway. In either case, the pretension of an excuse often does much good and usually does no harm.

A typical inventory in comparative form is presented in Illustration 27. *The relation between the figures in this comparative inventory and the ledger accounts is the essential point in the record. The physical inventory is taken*

in order to derive figures to use in the accounts. For this purpose the inventory sheet is so arranged that the figures to be used in the accounts stand out very prominently.

In Illustration 27 the amounts recorded in the "Valuation for Accounts" column each year are the ones that affect the accounts. The names of the accounts affected are also brought out quite prominently, except that the inventory of Miscellaneous Supplies affects General Expense account, Equipment Expense or Dairy Equipment Expense, or other account charged at the time the supplies were acquired.

In the case at hand, the valuation at Mar. 1, 1915, is considered as having been made for the purpose of opening a set of books at that time. Using the figures at that date as a basis, then, along with figures for cash, buildings, land, notes, and accounts receivable and payable, the opening entry would bear the following form, using figures shown in the Mar. 1, 1915, inventory of Illustration 27:

Cash.....	xxx	
Notes Receivable.....	xxx	
Cattle.....	\$1,446.00	
Swine.....	565.00	
Horses.....	1,760.00	
Poultry.....	134.50	
Sheep.....	100.00	
Equipment.....	576.00	
Equipment (Dairy).....	120.00	
Corn.....	450.00	
Oats.....	200.00	
Wheat.....	56.00	
Potatoes.....	36.00	
Hay, timothy.....	100.00	
Silage.....	120.00	
General Expense (Supplies on hand).....	11.50	
Notes Payable.....		xxx
Proprietor's Capital...		xxx

ILLUSTRATION 27
SAMPLE, COMPARATIVE INVENTORY RECORD

Property	March 7, 1915				February 29, 1910			February 28	
	No.	Average Unit Value	Extension	Valuation for Accounts	No.	Average Unit Value	Extension	Valuation for Accounts	Average Unit Value
<i>Livestock</i>									
<i>Cattle:</i>									
Cows, dry and milch	24	\$50.00	\$1,200.00		26	\$50.00	\$1,300.00		
Bull.....	1	50.00	50.00		1	45.00	45.00		
Calves.....	6	14.00	84.00		8	15.00	120.00		
Two year olds.....	4	28.00	112.00		6	20.00	120.00		
Total value of cattle.				\$1,446.00				\$1,585.00	
<i>Swine:</i>									
Boar.....	1	\$35.00	\$35.00		1	\$35.00	\$35.00		
Sows.....	10	20.00	200.00		10	18.00	180.00		
Pigs.....	55	6.00	330.00		50	5.00	250.00		
Total value of swine.				\$565.00				\$465.00	
<i>Horses:</i>									
Work and driving...	8	\$200.00	\$1,600.00		9	\$200.00	\$1,800.00		
Colts.....	2	80.00	160.00		2	75.00	150.00		
Total value of horses				\$1,760.00				\$1,950.00	

Additional columns may be added as the book in use permits.

ILLUSTRATION 27—*Continued*
SAMPLE, COMPARATIVE INVENTORY RECORD—*Continued*

Poultry:										
Chickens, all kinds..	160	\$.70	\$112.00		200	\$.70	\$140.00			
Turkeys.....	10	2.25	22.50		6	2.25	13.50			
Total value of poultry				\$134.50				\$153.50		
Sheep:										
All classes.....	25	\$4.00		\$100.00	none		all sold			
<i>Equipment</i>										
Wagons.....	2	\$35.00	\$70.00		2					
Harness.....	9	20.00	180.00		9					
Scales.....	1		10.00		1					
Wheelbarrows.....	2	1.50	3.00		2					
Grindstones.....	1		3.00		1					
Add other machinery and tools of a general nature, listed in de- tail.										
Grain binder.....	1		90.00		1					
Sulky plows.....	2	40.00	80.00		3					
Disk harrow.....	2	25.00	50.00		2					
Mower.....	1		35.00		1					

ILLUSTRATION 27—Continued
SAMPLE, COMPARATIVE INVENTORY RECORD—Continued

Property	March 1, 1915				February 29, 1916			February 28	
	No.	Average Unit Value	Extension	Valuation for Accounts	No.	Average Unit Value	Extension	Valuation for Accounts	No. Average Unit Value
Hay rake.....	1		\$15.00		1				
Corn planter.....	1		40.00		1				
Add other machines and tools in detail, used principally in crop production and harvesting									
Total Equipment....				\$576.00					
<i>Dairy Equipment</i>									
Separator.....	1		\$90.00		1				
Milk cans.....	30	\$1.00	30.00		35				
Add other dairy machines and tools in detail									
Total Dairy Equipment.....				\$120.00					

ILLUSTRATION 27—Continued
SAMPLE, COMPARATIVE INVENTORY RECORD—Continued

<i>Products</i>		\$.50		\$450.00	850	\$.50		\$425.00
Corn..... bu.	900	\$.50		\$450.00	850	\$.50		\$425.00
Oats..... "	500	.40		200.00	600	.30		180.00
Wheat..... "	70	.80		56.00	40	.90		36.00
Potatoes..... "	60	.60		36.00	50	.60		30.00
Hay, timothy.... tons	10	10.00		100.00	15	10.00		150.00
Silage..... "	40	3.00		120.00	50	3.00		150.00
Add other products as occasion demands								
<i>Miscellaneous Supplies</i>								
Cement, sacks	15	\$.50	\$7.50		none			
Nails..... lbs.	50	.08	4.00		30	.08	\$2.40	
Add other supplies as oil, grease, wire, etc. in detail								
Total valuation of misc. supplies.....				\$11.50				\$2.40

It is to be observed from the pro forma entry above that only those amounts are extended in the "valuation for accounts" column of the inventory sheet that are to be transferred to accounts in the ledger. For example, the title "calves" appears in the inventory, but their value is not shown as a separate item in the column called "valuation for accounts" because there is no ledger account with calves. The transactions with calves are recorded in the Cattle account. In the inventory record, therefore, the calves are included with the total cattle in the "valuation for accounts" column. For a similar reason each of the farm product items is extended into the valuation column.

The inventories of Equipment and Dairy Equipment are shown separately, but both of the totals are carried to the Equipment account. Showing them separate in the inventory record enables one to calculate depreciation on the two classes of Equipment separately, if occasion demands.

The Equipment and Dairy Equipment items are detailed in the inventory sheet only for the purpose of listing the great variety of items for future reference, and to show the quantities. The value of the equipment items is not shown, either in detail or in total, except at the time of opening the account books. The inventory value of Equipment at the close of a year is obtained by deducting a given percentage of depreciation, such depreciation and inventory values being recorded in the account without being shown first on the inventory record. This is discussed under "Depreciation," below.

The inventory sheet is not totaled, as the totals are not used for any purpose. After depreciating the equipment and entering the several items of the valuation column in their respective ledger accounts, closing and bringing down the balances, the total value of possessions can be found easily from the trial balance after closing or from the Statement of Resources and Liabilities.

The amounts in the "valuation for accounts" column under date of Feb. 29, 1916 (Illustration 27) are considered as the values at the close of the first fiscal year and the beginning of the second. Accordingly, their use is that previously described herein and presented in Illustrations 25 and 26. For example, under date of Feb. 29, 1916, Cattle account would be credited with \$1585 after taking the preliminary trial balance. The debit would be recorded in Cattle account also, under the double lines after closing.

Livestock Inventory in Accounts.—Illustration 28 shows accounts affected by inventory items. It is presented for the purpose of showing more clearly the relation existing between the inventory record and the ledger accounts.

The Cattle account is selected as a fair representative of the principles governing the several livestock accounts. The inventory of \$1446 on the debit side of the account is posted from the opening journal entry on March 1, 1915, as given on page 141. The figure was taken originally from the "valuation for accounts" column of the inventory record, Illustration 27, being the total value of cattle. The inventory of \$1585 on the credit side of Cattle account is obtained directly from the same page of the inventory record, but from the valuation column of Feb. 29, 1916, which is one year later. The entries of May 20 and Nov. 1 are assumed merely for illustrative purposes.

Crop and Field Inventory in Accounts.—The Corn account is selected as a representative type of product accounts in Illustration 28. It is presented with the inventory figures as shown in the inventory record on page 145 being \$450 on March 1, 1915, and \$425 at the close of the fiscal year Feb. 29, 1916. The \$450 at the beginning appears in the ledger account as a posting from the opening entry as given on page 141. Ordinarily, however, it would

ILLUSTRATION 28

LEDGER ACCOUNTS AND THEIR RELATIONS TO THE INVENTORY
RECORD*Cattle*

1915	1915
Mar. 1 Capital Invest.	Nov. 1 Cash sale . . . \$500.00
per Inventory	1916
Record \$1,446.00	Feb. 29 Inventory per
May 20 Veterinary ... 25.00	Inventory
1916	Record 1,585.00
Feb. 29 Net Gain to	
Loss and Gain	
a/c 614.00	<u>\$2,085.00</u>
	<u><u></u></u>
<u>\$2,085.00</u>	
<u><u></u></u>	
1916	
Feb. 29 Invty. brought	
down \$1,585.00	

Corn

1915	1915
Mar. 1 Capital Invest.	Dec. 16 Cash sale . . . \$506.00
per Inventory	1916
Record \$450.00	Feb. 29 Inventory per
1916	Inventory
Feb. 29 Net Gain to	Record 425.00
Loss and Gain	
a/c 481.00	
	<u>\$931.00</u>
<u>\$931.00</u>	<u><u></u></u>
<u><u></u></u>	
1916	
Feb. 29 Invty. brought	
down \$425.00	

General Expense

1915		1916	
Mar. 1 Capital Invest.		Feb. 29 Inventory per	
per Inventory		Invty. Rec-	
Record (ce-		ord (nails)...	\$2.40
ment and		Feb. 29 Bal. to Loss &	
nails).....	\$11.50	Gain a/c....	169.10
1916			
Feb. 29 Sundries from			
Cash journal			
column.....	160.00		
	<u>\$171.50</u>		<u>\$171.50</u>
1916			
Feb. 29 Invty. brought			
down (nails).	\$2.40		

appear as an item carried down below the double lines from the preceding year.

Miscellaneous Supplies Inventory in Accounts.—In showing the relation between miscellaneous supplies in the inventory record and in the accounts, the General Expense account is used in Illustration 28. The two classes of supplies specifically designated in the inventory record Illustration 27 are cement and nails. At the time these commodities are purchased they are charged to General Expense. When purchased in large quantities, they are not all used in the year in which they were purchased. In order properly to show in the General Expense account what supplies are used in a given year, an inventory is taken of the supplies on hand at the close of the year. These supplies are then credited to the General Expense account before closing, and debited below the double lines

to General Expense account after closing, thus effecting a "sale" of the commodities to the succeeding year's business. Such an entry decreases the General Expense for the year below what it would be if the inventory of supplies as cement, nails and so on were not considered. It increases the expense of the succeeding year. In other words, the expense of the year is increased in which the cement and nails are used, regardless of when they are purchased.

Considering the General Expense account of Illustration 28 with the inventory record, it is seen that the \$11.50 debit in the account is the same as the total miscellaneous supplies on March 1, 1915, in the valuation column of the inventory record. Also, the \$2.40 credit in the account is the same as the total of miscellaneous supplies Feb. 29, 1916.

Although General Expense account has been used in illustrating the relation between ledger accounts and the inventory of miscellaneous supplies it is not the only account that might be affected by an inventory of miscellaneous supplies. Any given inventory of sundry articles affects the account that was debited when the articles were purchased. For example, when axle grease is bought, it is charged to Equipment Expense account. If only one or two boxes are bought at a time, they need not be considered in the inventory. However, if a large quantity is bought a short time before the close of the fiscal year, it should be inventoried as one of the miscellaneous supplies. In recording the inventory for such axle grease, the entry both credit and debit is made in the Equipment Expense account, in a way similar to that used in recording nails in General Expense account of Illustration 28.

Cost price is taken as a basis for valuing the products and miscellaneous supplies from year to year. However, when one does not operate under a cost system, the cost

price being difficult to determine, it is necessary to estimate a cost price for the products. This is sometimes easily done by taking a percentage of market price—say 5% or 10% off. Such an inventory valuation is unsatisfactory as a rule. Livestock is inventoried at a fair value on the farm, always less than the selling price, in order to avoid showing fictitious profits. The same average unit value for each class of livestock should be maintained from year to year, as far as possible.

Depreciation.—*Depreciation is a decrease in the value of property.* The term is used on a farm in connection with buildings and equipment. Other possessions are not considered as depreciating to the extent that special accounting recognition must be taken of them. Hay may depreciate in a stack or corn in a crib under certain conditions, but such depreciation is taken care of in the annual inventory. *Taking an inventory, then, is one way of providing for depreciation. It is known as the "Revaluation" method of calculating the amount of depreciation. There are two main points to consider in depreciation, (a) the calculation of the amount of wear and tear expressed in dollars and cents and (b) the recording of the amount so calculated in the books.*

In the case of buildings and equipment it is more difficult and unsatisfactory to calculate depreciation according to the revaluation method, so the percentage method is used. There are several ways of calculating depreciation by percentage. The most common is called the "straight line" method, in which the anticipated number of years of life of the asset is divided into the original cost in order to find the depreciation for each year. If a machine costs \$100 and it is estimated to last 10 years, the depreciation for each year is calculated as 1/10 of \$100. The 1/10 is more often reduced to a percentage basis, making it 10% of \$100.

A method similar to the straight line, which is very practical and sufficiently accurate for farm purposes, is an unscientific modification of the "diminishing value" method. As practiced on the farm, it consists in calculating a certain percentage of the book value at the close of each year. The percentage is based on the number of years of life of the machine or building, e.g., 10% for a machine or building expected to last 10 or 15 years. This method never reduces the book value to zero. That is one element in its favor as far as use on the farm is concerned.

Recording Depreciation in Accounts.—Under the "diminishing value" method as practiced on the farm, if Equipment account has a balance of \$1000 at the beginning of the year and 10% is considered as a reasonable rate of depreciation, the entry at the close of the year is a debit to Equipment Expense and a credit to Equipment of \$100. This would leave a balance of \$900 in the Equipment account at the beginning of the second year. At the end of the second year, the entry would be for \$90 (10% of \$900, the book value at the beginning of the year). At the end of the third year, it would be \$81 (10% of \$810). If at the beginning of the third year, \$50 worth of new machinery is purchased, the depreciation calculated at the close of the year is 10% of \$860.

The effect of the entries for depreciation as stated above is to decrease the profits of each year and decrease the value of the resource depreciated. The profits are decreased because the annual charge to Equipment Expense account represents the wear and tear on the equipment for the year.

Diminishing Value and Straight Line Depreciation.—The rate of 10% as used in the examples above is a conservative and practical rate to use in calculating depreciation on farm equipment, under the diminishing value method. A given rate used under this method results in

a less annual amount of depreciation than the same rate under the straight line method. Illustration 29 shows a more or less hypothetical case in which the two methods are compared. In this Illustration it is presumed that some equipment is purchased for \$1000. A rate of 10% is used under the straight line method and also under the diminishing value method. It is seen from the Illustration that under the straight line method the value of the equipment at the end of ten years is zero, while under the diminishing value method it is \$348.68. By carrying the calculations on to the end of the twentieth year under the diminishing value method it is seen that the value of the original equipment at that time is \$121.57.

Illustration 29 also shows that the amounts charged to Equipment Expense account aggregate \$1000 in ten years under the straight line method at 10% while they aggregate only \$878.43 in twenty years at the same rate per cent. under the diminishing value method.

The principal point to remember in connection with Illustration 29, and the comparison of results under the two methods of calculating depreciation, is that a given rate of depreciation does not always mean the same thing. Some might say, for example, that 10% is too high a rate for all equipment, having in mind that it means charging off all of the value of the resource in ten years. Others might say that 10% is too low a rate, having in mind that even within a period of twenty years the resource is not entirely charged off.

In the case of farm equipment 10% under the diminishing value method represents the conditions better and simpler than with any other method or rate. The rate is easy to use in calculation, and the results interpret very closely the actual wear and tear on equipment in general. Depreciation is greater in the early years and less in the later

ILLUSTRATION 29

VALUE OF \$1,000 WORTH OF EQUIPMENT AT CLOSE OF EACH YEAR
AND AMOUNT CHARGED OFF WHEN DEPRECIATED AT 10% UNDER
THE STRAIGHT LINE AND DIMINISHING VALUE METHODS

At Close of Year No.	Straight Line Deprecia- tion at 10%		Diminishing Value De- preciation at 10%	
	Value at Close of Year	Depreciated During Year	Value at Close of Year	Depreciated During Year
1	\$900.00	\$100.00	\$900.00	\$100.00
2	800.00	100.00	810.00	90.00
3	700.00	100.00	729.00	81.00
4	600.00	100.00	656.10	72.90
5	500.00	100.00	590.49	65.61
6	400.00	100.00	531.44	59.05
7	300.00	100.00	478.30	53.14
8	200.00	100.00	430.47	47.83
9	100.00	100.00	387.42	43.05
10	Zero	100.00	348.68	38.74
11			313.81	34.87
12			282.43	31.38
13			254.19	28.24
14			228.77	25.42
15			205.89	22.88
16			185.30	20.59
17			166.77	18.53
18			150.09	16.68
19			135.08	15.01
20			121.57	13.51
Total Depreciation \$1,000.00			\$878.43	

years of a machine's life.¹ Under this plan, it is considered that new equipment is purchased from time to time before all of the old equipment becomes absolutely valueless. This fact tends to equalize the depreciation from year to year, while allowing for a conservative life of the various units of equipment.

Building Depreciation.—The general principles governing the calculation of depreciation on equipment apply in the case of depreciation on buildings. A rate of 5% on the diminishing value is conservative for the average farm buildings. The annual entry for building depreciation is a debit to Building Expense account and a credit to Buildings.

General Theory of Depreciation.—Other methods of calculating depreciation are not considered practical enough for farm use, hence are not discussed here.

An account called Reserve for Depreciation is used in commercial accounting to which is credited the depreciation instead of crediting (decreasing) the property account direct. The Statement of Resources and Liabilities is then prepared in such a way as to show the resulting value of the properties exactly as is shown in the ledger accounts under the method presented herein.

Likewise, it is not considered necessary to discuss why depreciation is an element of expense. Not many years ago accountants had great difficulty in impressing upon judges, lawyers and business men in general the fact that depreciation was an expense. At present, however, the business world is generally coming to recognize the fact that a deterioration of capital requires an entry on the books in order to show the true conditions. It has been pointed out in earlier chapters herein, that a decrease in capital requires a debit to Loss and Gain or some other nominal account, which is really a subdivision of the Capital account itself.

¹ Bulletin 145 Minnesota Agricultural Experiment Station, pp. 24-25.

Closing Journal Entry.—This does not bring up a new subject but merely presents an old principle in a new way. It deals with the process known as closing the ledger. This subject has been presented under the title, "Transfer or Closing Entries" in Chapter III. That discussion considered the closing without the process of posting, the ledger being the only book used.

When books of original entry are used they must be used for all entries except those involving only one account, as in bringing down balances or inventories. Clos-

ILLUSTRATION 30

CLOSING JOURNAL ENTRIES

GIVEN ACCOUNTS AS FOLLOWS, TO PREPARE CLOSING JOURNAL ENTRIES

<i>Labor</i>	
1917	
Jan. 31.....	\$30.00
Feb. 28.....	30.00
<i>Swine</i>	
1916	1917
Mar. 1.....	Jan. 20 Cash.....
\$500.00	\$250.00
	Feb. 28 Inventory...
	400.00
<i>Corn</i>	
	1917
	Jan. 31 Cash.....
	\$100.00
<i>General Expense</i>	
1917	
Jan. 31.....	\$100.00
Feb. 28.....	80.00

The following closing journal entries are prepared:

Loss and Gain.....	\$60.00	
Labor.....		\$60.00
Swine.....	150.00	
Loss and Gain.....		150.00
Corn.....	100.00	
Loss and Gain.....		100.00
Loss and Gain.....	180.00	
General Expense....		180.00
Loss and Gain.....	10.00	
Proprietor's Capital..		10.00

ing entries involve the nominal accounts, some mixed accounts, and the Capital account at the same time. Accordingly they are made in the journal rather than in the cash book. If the cash journal is used they are made in the "sundry" columns, each item being posted separately.

The entries are made at the same time, under the same conditions and with the same debits and credits expressed as they are when made into the ledger accounts direct. When made in the journal they must be posted to the ledger accounts involved. The ledger accounts affected are then dealt with as previously discussed.

In commercial accounting it is considered better to make the closing entries after preparing the financial statements. In farm accounting it is simpler to make the closing entries and close the ledger before preparing the statements. This was brought out in the discussion of the trial balance after closing, in Chapter IV.

A typical closing entry is presented in Illustration 30. The singular word "entry" is used although the process under this method is a series of entries. The series of entries is better than one combined entry. It avoids analysis of the Loss and Gain account later.

The last entry above is made after posting the other entries and finding the balance remaining in Loss and Gain account to be closed into Capital. The amount can be calculated on a piece of scratch paper, however, and thus permit all the closing entries to be made at one time.

After posting the closing journal entries, the several nominal accounts should be ruled off and the balance of Capital account brought down below the double lines.

ILLUSTRATIVE PROBLEMS

1. (a) Make entries in simple journal and cash book for the year's transactions.

(b) Post to the ledger leaving enough space for entries of problem 2 below, and take a trial balance.

(c) Make and post the necessary journal entries, closing the proper accounts into Loss and Gain account and the latter into Capital account.

(d) Rule off the accounts, and bring down the necessary balances.

(e) Take a trial balance after closing. The inventories at the beginning and close of the period are to be recorded in the comparative inventory record.

Feb. 1, 1916. W. L. Miller begins keeping accounts on the farm, owing \$5000 on a mortgage note and investing Cash \$2500, land valued at \$12,000, buildings worth \$5000, and other property as detailed below. Cattle: 4 milch cows at \$60 each; 2 calves at \$25 each; 2 two-year-olds at \$35 each. Swine: 1 boar \$45; 15 sows at \$35 each; 30 pigs at \$12 each. Horses: 6 work and driving, at \$150 each; 2 colts at \$90 each. Poultry: 100 chickens, all kinds averaging \$0.90 each; 4 turkeys averaging \$1.60 each.

Equipment: 2 farm wagons complete with box and side-boards at \$76.35; 1 handy wagon and rack at \$37.50; 1 spring wagon, \$60.95; 1 light buggy with pole and shafts, \$65; 1 four-cylinder automobile, \$250; 5 sets double work harness, at \$31.25; 1 set double driving harness, \$25; 1 set single driving harness,

\$21.75; 1 grain binder, \$90; 2 gang plows at \$59; 1 walking plow, \$10.90; 1 corn planter, \$28; 1 spike tooth harrow, \$18.25; 1 disk-harrow, \$23; 1 two-horse 4-shovel cultivator, \$12.50; 1 two-horse 6-shovel cultivator, \$15; 1 roller, \$28.80; 1 grain drill, \$78; 1 lime spreader, \$35; 1 six-foot mower, \$43.50; 1 hay rake, \$7; 1 hay tedder, \$41; 1 manure spreader, \$40; 1 hay loader, \$55.65; 1 corn sheller, \$13.50; 1 platform scale, \$7.70; 1 clipping machine, \$9; 2 wheelbarrows at \$3.60; 2 large hand rakes at \$0.66; 3 scoop shovels at \$1.10; 3 bushel baskets at \$0.25; 2 hay racks at \$10; 1 half-bushel measure, \$0.53; 1 peck measure, \$0.40; 1 scythe, \$0.85; 1 hay knife, \$1; 1 hay fork, \$0.65; 1 hay carrier outfit, \$12; 4 husking mittens at \$0.75; 2 corn knives at \$0.35; 25 grain sacks at \$0.30; 1 poultry drinking fountain, \$0.65; 8 chicken coops at \$1.50; 1 pair sheep shears, 0.90; 5 horse blankets at \$3.50; 3 horse brushes at \$0.55; 3 currycombs at \$0.15; 8 fly nets at \$1.20; 12 halters at \$1.15; 1 saddle, \$8.45; 1 wagon jack, \$1.25; 1 lap robe, \$5; 1 grindstone, \$4.50; 1 post hole digger, \$1.50; 1 tile spade, \$1.15; 1 long handle shovel, \$1.10; 1 step ladder, \$1.75; 1 thirty-two foot extension ladder, \$4.20; 1 jack screw, \$2.25; 3 lanterns at \$0.95; 1 feed grinder, \$7.25; 2 axes at \$1.30; 1 hatchet, \$0.85; 1 wooden mallet, \$0.30; carpenter, blacksmith and mason's tools as listed on door in tool shed, \$75.

Dairy Equipment: 1 cream separator, \$30; 5 milk cans at \$1.75; 5 milk pails at \$0.60; 1 churn, \$5; 1 milk strainer, \$0.65; 1 thermometer, \$0.30; 2 calf muzzles at \$0.25; 1 dehorning clipper, \$5.75.

Products: 400 bushels of corn at \$1.30; 320 bushels of oats at \$0.50; 80 bushels barley at \$1; 20 tons timothy at \$12; 25 tons silage at \$4; 15 tons straw at \$4; 6 cwt. millfeed at \$1.30.

Miscellaneous Supplies: 3 reels barbed wire for repairs to fences (charge General Expense) at \$4.50; 1 keg staples, \$5; 1 keg shingle nails, \$5.50; one-half barrel machine oil, \$6.50 (charge Equipment Expense).

Household: Furnishings, including chairs, beds, tables, stoves, carpets, pictures, books, clothing and kitchen utensils valued at \$900. (These need not be itemized in detail in the inventory record.)

Feb. 7. He buys stock feed for \$40 cash and poultry feed for \$5 cash.

Feb. 8. Buys five horses from A. Allen for \$1700, paying \$700 in cash and the balance with a six months' note bearing 6% interest.

Feb. 9. Buys two sets of harness for \$50 cash.

Mar. 1. Pays \$150 interest on mortgage note for six months ended today (Dr. General Expense).

Mar. 1. Buys 17 cows from L. List \$750, for which he gives his note for \$500, the balance to be settled later.

Mar. 10. Buys 40 sheep from M. Mann on account, \$175.

Apr. 1. Pays \$32 cash for a new hay rake¹ to replace one worn out.

Apr. 30. Pays L. J. Johnson his wages for the month, \$45 cash.

May 31. Sells eggs for cash, \$10.

May 31. Sells to Coöperative Creamery on account 540 lbs. butter fat at \$0.35. (Represents the sales of the month.)

June 30. Sells to the Coöperative Creamery on account 470 lbs. butter fat at \$0.35. Sells eggs for cash \$8.

July 18. Paid for re-shingling horse barn, \$40.

Aug. 31. Pays \$55 for sundry labor.

Sept. 1. Pays \$150 interest on mortgage for six months ending today.

Sept. 6. Buys stock feed for \$60 cash.

Oct. 31. Sells 500 lbs. butter fat at \$0.35 cash.

Nov. 20. Sells 20 sheep for \$110 cash.

Nov. 21. Pays M. Mann on account \$125.

Dec. 1. Sells the remaining sheep and lambs for \$145 cash.

Dec. 8. Pays \$1050 to A. Allen to redeem note of Feb. 8th, which had been extended; and to pay interest on same.

Dec. 9. Sells swine (3800 lbs.) at \$13 per cwt. for cash.

Dec. 10. Sells to Coöperative Creamery 400 lbs. butter fat at \$0.35, on account.

Dec. 31. Receives cash from the Coöperative Creamery \$300 to apply on account.

¹ Since depreciation takes care of the hay rake worn out, the new one is to be charged to Equipment account.

Jan. 16, 1917. Pays fire insurance premium on one-year policy, \$15.

Jan. 31. Pays taxes for the year, \$130.

Jan. 31. Pays \$6.50 for barrel of gasoline for automobile.

Jan. 31. Pays \$24 for new tile¹ to replace similar ones in the field.

Jan. 31. The proprietor values his labor for year at \$600.

Jan. 31. The inventories of properties requiring an inventory at the close of the year are indicated by the following facts and figures: Buildings depreciated 5% during the year (diminishing value method). Equipment and Dairy Equipment depreciated 10% during the year (diminishing value method). All of the articles of equipment are on hand at the close of the year except the old hay rake, one scoop shovel, 3 grain sacks, pair of sheep shears and a jack screw, the latter two being located at the farm of a neighbor to whom they had been loaned.

Livestock Inventory: Cattle—20 milch cows at \$60 each; 5 calves at \$28 each; 1 two-year-old \$35. Swine: 1 boar, \$50; 17 sows at \$37; 35 pigs at \$15. Horses: 12 at \$150 each; 3 colts at \$85 each. Poultry: 120 chickens, all kinds averaging \$0.90 each; 12 turkeys, averaging \$1.70 each.

Products Inventory: 500 bushels corn at \$1.25; 350 bushels oats at \$0.45; 15 tons timothy at \$12; 22 tons silage at \$3.75; 20 tons straw at \$3.80; 4 cwt. mill feed at \$1.40; 100 bushels wheat at \$1.70.

Miscellaneous Supplies Inventory: 2 reels barbed wire for repairs to fences at \$4.50; $\frac{3}{4}$ keg staples at \$5; one barrel gasoline, \$6.50.

Household Inventory: Furnishings complete valued at \$900.

2. Using the same journal, cash book, ledger and comparative inventory record as in problem 1 above, continue keeping the books of W. L. Miller for the fiscal year Feb. 1, 1917, to Jan. 31, 1918, inclusive. The inventory record already contains the quantities and necessary values as of Feb. 1, 1917. If your trial balance after closing, as in problem 1 (e) above, was cor-

¹No depreciation is recorded for tile, hence replacements are charged to General Expense.

rect, you are ready to proceed with the succeeding year's record.

(a) Make entries in simple journal and cash book for the year's transactions:

(b) Post to the ledger and take a trial balance, using the same ledger accounts as in problem 1 above when possible.

(c) Make and post the necessary journal entries, closing the proper accounts into Loss and Gain account, and the latter into Capital account.

(d) Rule off the accounts and bring down the necessary balances or inventories.

(e) Take a trial balance after closing. The inventories at the close of the year are to be placed in the space reserved for the third inventory in the comparative inventory record.

Feb. 2, 1917. He buys one-half barrel machine oil for \$7 cash.

Feb. 28. Buys one corn planter, \$32 cash.

Mar. 1. Sells 100 bushels of wheat at \$2. Sells 210 bushels of oats at \$0.60. Pays \$150 interest on mortgage note for six months ended today. He also pays \$500 in reduction of the principal.

Mar. 16. Sells his walking plow for \$6¹ and buys a new gang plow for \$53 cash.

Mar. 28. Sells some shotes (2500 lbs.) at \$14 per cwt.

Apr. 1. His son Wayne withdraws from college and agrees to work on the farm for \$25 in cash per month and his board, which is valued at \$15 a month. The regular wage is \$40 a month and board. (No entry is necessary until the close of the month or until he draws some cash on account.)

Apr. 22. Receives cash from sale of eggs, \$12.

Apr. 30. Sells to Coöperative Creamery on account 300 lbs. butter fat at \$0.35.

Apr. 30. Wayne is credited with monthly wage including

¹ It is necessary only to credit equipment and debit cash with \$6 for the sale of the old plow. The entry for depreciation is supposed to take care of the loss.

board.¹ (Dr. Labor \$25; Cr. Wayne \$25; also Dr. Labor \$15; Cr. Household \$15.)

May 10. Receives a check from Coöperative Creamery \$298.50 in full of account.

May 31. Entry required for services of Wayne in May.

June 16. Pays \$40 cash for some new household furnishings—1 rocking chair and 1 rug for sitting-room.

June 30. Entry required for services of Wayne in June.

July 3. Wayne draws \$20 cash.

July 15. Sells eight tons timothy hay at \$17 a ton.

July 31. Wayne is credited with July labor.

Aug. 18. Sells 1600 bu. wheat to the Mutual Elevator Co., at \$2 a bushel and receives \$1200 in cash and a \$2000 note, payable in 90 days from Aug. 18, with interest at 6% per annum.

Aug. 18. He discounts the \$2000 note of the Mutual Elevator Co. at the bank, which deducts \$30 discount and gives him credit in his checking account for the proceeds. (Debit Cash and credit Notes Receivable \$2000 on the cash receipts side. Debit General Expense, and credit Cash for \$30 on the cash payments side.)

Aug. 20. He pays L. List \$780, of which \$500 is in payment of note of Mar. 1, 1916, \$30 for interest on same, and \$250 to settle the open account. (The note did not draw interest, but it and the open account have remained unpaid so long, that the \$30 is contributed in lieu of interest.)

Aug. 31. Wayne is credited with August labor.

Sept. 1. Pays \$135 interest on mortgage note for 6 months ended today.²

Sept. 1. Pays \$2500 in reduction of the principal of the mortgage note.

Sept. 16. Pays for sundry labor during threshing season \$7.

Sept. 16. Wayne decides to return to college, so is credited

¹It should be noted that Wayne does not draw any cash at this time.

² Note that this interest payment is \$15 less than the preceding ones on March 1 and September 1 of each year. It is due to the fact that \$500 was paid off on March 1, 1917, leaving only \$4500 to draw interest at 6% from March 1 to September 1, 1917.

with one-half month's wages for Sept. (The Household is credited for his board for same period.)

Sept. 17. Gives Wayne \$117.50 to close his account and a special allowance of \$200 more. (This \$200 is not a farm expense and should accordingly be charged to Household.)

Oct. 1. Some of the twelve-inch trunk tiling in field No. 3 being inadequate has been removed and replaced by new fourteen-inch of similar grade. The larger size tile cost \$85, which was \$15 more than the twelve-inch. (Credit cash \$85, debit Land \$15 and debit General Expense \$70.)

Note.—Since the labor required in making the change is not a proper charge to Land account under the conditions, it need not be considered here. Mr. Miller did the work, so it will be charged to Labor account as part of the \$600 entry at the close of the year.

Oct. 30. Sells his automobile for \$175 cash.¹

Oct. 31. Sells 250 lbs. butter fat for \$87.50 cash.

Nov. 18. Sells 20 turkeys for \$50 and 60 chickens for \$100 cash.

Nov. 30. Sells 200 lbs. butter fat for \$70 cash.

Dec. 28. Pays \$35 for a trip for self and family. (This is not an expense of operating the farm.)

Dec. 31. Pays \$10 for extra labor while away. (Debit Labor account.)

Jan. 16, 1918. Pays fire insurance premium on a one year policy, \$15.

Jan. 31. Pays taxes for the year \$140.

Jan. 31. An entry is made to adjust labor of Wayne to the standard cost of hired help during the months Apr. 1 to Sept. 16.

Jan. 31. The proprietor values his labor for the year at \$600.

Jan. 31. The inventories of properties requiring an inventory at the close of the year are indicated by the following facts and figures: Buildings depreciated 5% during the year (diminishing value method). Equipment and Dairy Equipment depreciated 10% during the year (diminishing value method). All of the articles of equipment are on hand at the close of the year except

¹ It is necessary only to credit Equipment and debit Cash with \$175. The depreciation is supposed to take care of the loss.

those indicated in the transactions since Jan. 31, 1917, as having been sold. The articles of equipment purchased during the year must be considered in the Inventory Record.

Livestock Inventory: Cattle: 21 milch cows at \$60; 7 calves at \$28; 3 two-year-olds at \$35. Swine: 1 boar, \$50; 20 sows at \$37; 30 pigs at \$15. Horses: 13 at \$150; 3 colts at \$85. Poultry: 90 chickens, all kinds, averaging \$0.90 each; 8 turkeys, averaging \$1.70 each.

Products Inventory: 700 bushels corn at \$1.40; 300 bushels oats at \$0.45; 12 tons timothy hay at \$12; 20 tons silage at \$4; 15 tons straw at \$3.90.

Miscellaneous Supplies Inventory: 2 reels barbed wire for repairs to fences at \$4.50; $\frac{1}{4}$ barrel machine oil, \$3.75.

Household Inventory: Furnishings complete, valued at \$900.

3. On April 1, 1916, Mr. John Jones, proprietor of the Lone Tree Farm, takes an inventory of his farm possessions; and after ascertaining his wealth as valued in the inventory decides to keep accounts of his transactions in a systematic way.

He accordingly provides himself with a cash journal and ledger. Cash-journal columns are used as follows: Household Dr., Ed Wise Dr., Cash Dr., Sundry Dr., Sundry Cr., Cash Cr., Ed. Wise Cr.

You are asked to keep the books for him, recording all the transactions to the best of your ability; and posting them to the ledger under the proper account titles. The keeping of the inventory record book is omitted.

The inventory taken, April 1, 1916, contains the following figures: Land, \$15,000; buildings, \$3000; horses, \$470; cattle, \$70; hogs, \$1000; sheep, \$500; corn, \$319.55; potatoes, \$2.70; clover hay, \$69; seed corn, \$32.20; mill feed, \$25.86; equipment, \$739; cash, 413; household furnishings, \$700.

Since he does not raise oats, any oats he buys are to be considered as feed.

The transactions are as follows:

April 8. He receives a money order for \$15 from Wm. George for seed corn, which is shipped by freight.

April 9. Ships seed corn to J. Green, having received \$28 in payment of same, today.

April 25. Pays Ed. Wise \$15 for 12 days' labor. (This does not require the use of the special Ed. Wise columns.)

May 2. Receives from J. M. Whiton 4 bushels of seed potatoes; and sends him a New York draft for \$16 in payment. The bank charges 10c for the draft. (Debit potatoes \$16, General Expense \$0.10 and credit cash \$16.10.)

May 3. Buys 2 tons of middlings at \$22, and a barrel of salt, \$1.50 (consider both items as Feed).

May 5. Has 1000 each of envelopes (\$2.50) and letter heads (\$3.75) printed, paying cash for same.

May 7. Has had so much trouble to get competent help on the farm that he makes a contract with Ed. Wise, who has been working for him off and on for some time, to work by the year at \$420. Wise is to board all the extra help employed on the farm, and in addition to the wages agreed on, to have a truck patch, pasture for cow and house rent free of charge. Contract is dated May 1. It was mutually agreed that Mr. Jones should credit Mr. Wise at the close of each month with the amount he had earned during the month; and that Mr. Wise could draw against the account at any time.

May 10. Buys a sheep shearing machine, \$15.

May 25. Pays Eli Johnson \$40 for stallion service.

May 31. Credits Wise with wages.

June 2. Wm. George, to whom Jones shipped seed corn on April 8, writes that it hasn't arrived—that it is now too late—he can't accept, and wants his money refunded. In order to retain the good will of his customer, Mr. Jones refunds the money (\$15) by bank draft; and makes a claim against the A. D. R. R. Co. for the amount, including 10c for the draft. (Debit the R. R. Co. with the full amount paid. If the R. R. Co. should not settle within a reasonable time, their account would then be closed into General Expense as a bad debt.)

June 8. Sells his wool—726 lbs. at 16c. He pays 60c for resetting shoes on Prince, and \$3 for mower repairs.

June 22. Pays John Dole and Sam Peek each \$6 for three days' labor.

June 24. Sells 20 hogs, averaging 230 lbs. each, at \$13.50.

June 24. Pays for household supplies \$22 and for furnishings \$38.

June 28. Ed. Wise draws \$20 on account.

June 30. Ed. Wise is credited with wages.

July 20. Sends \$6 and \$5.20 respectively to two farm periodicals to pay for seed corn advertisements. The money orders cost him 16c. (Debit Seed Corn \$11.20, General Expense \$0.16.)

July 21. Accepts the stock scale put in for him by E. Thomas, and pays \$65 for it.

July 28. Buys 100 bushels of oats at 50c.

July 31. Credits Ed. Wise with wages.

Aug. 3. Gives Ed. Wise \$10 on account.

Aug. 15. The roads are good and he has the time, so he puts in the coal needed by the household for winter, 10 tons at \$4.75.

Aug. 23. Pays Joe Morgan \$24 for threshing 800 bushels of wheat at 3c.

Aug. 26. Pays \$18 for household supplies and \$25 for clothing.

Aug. 28. Buys 100 lbs. linseed meal at \$27 a ton, and a keg of nails at \$3.70. (Debit Building Expense for the nails.)

Aug. 30. Sells 80 bushels of wheat at \$2.

Aug. 31. Credits Ed. Wise with wages.

Sept. 5. Buys 2½ tons of fertilizer at \$18. (Debit Fertilizer.)

Sept. 8. Buys two tons of middlings for \$24 a ton.

Sept. 10. Gives his wife \$20.

Sept. 20. Buys 4 bushels of timothy seed for \$10. (Debit 1917 timothy crop.)

Sept. 27. Pays freight on timothy seed \$0.60. (Debit 1917 timothy crop.)

Sept. 28. Pays John Betts \$22.50 for ten days' labor.

Sept. 30. Credits Ed. Wise with wages.

Oct. 3. Gives Ed. Wise \$10 on account.

Oct. 15. Sells 25 head of hogs, averaging 200 lbs., for \$13 a cwt.

Oct. 20. Sells 150 bushels of potatoes at \$1.80. (Consider potatoes as a crop account.)

Oct. 25. Takes 20 bushels of potatoes for personal use and

also gives Ed. Wise 20 bushels, charging \$1.70 a bushel in each case. The truck patch allowed Ed. Wise did not raise potatoes. (No cash is involved in the transaction.)

Oct. 30. Pays John Betts \$2.25 a day for 15 days' work.

Oct. 31. Credits Ed. Wise with wages.

Nov. 15. Sells 117 lambs, averaging 100 lbs., at \$9.50 per cwt. Buys 500 bushels of corn at \$1.50, not for seed.

Nov. 20. Sells 34 head of hogs at \$12 per cwt. Average weight is 220 lbs.

Nov. 23. Pays for husking his corn crop, 2000 bushels at 3c a bushel.

Nov. 29. According to contract made in March, he sells for cash to the Williams Seed Co., his crop of corn for seed at 25c a bushel above market price. After sorting, it amounts to 1600 bushels, calculated at \$2 a bushel. (Dr. Seed Corn, Cr. Corn \$2800 [1600 at \$1.75] Dr. Cash, Cr. Seed Corn \$3200 [1600 at \$2].)

Nov. 30. Pays John Betts and Sam Peck each \$22.50 for ten days' labor.

Nov. 30. Credits Ed. Wise with wages.

Dec. 5. Ed. Wise is given 3 hogs to butcher, same to be charged to his account. Weight averages 240 lbs. at \$12 per cwt.

Dec. 8. Butchers 3 hogs himself. Average weight 230 lbs. at \$12 per cwt.

Dec. 10. Has some shoeing done, \$4.75.

Dec. 15. Gives his wife \$50, and takes \$47 himself for personal use.

Dec. 18. Buys 200 bushels of oats, paying 55c. He renews his subscriptions to various stock and farm journals, costing \$6.60. He also pays 12c for money orders, and \$2 for postage stamps. (Subscriptions to farm journals are charged to General Expense. Subscriptions to popular journals and newspapers are charged to Household.)

Dec. 23. Gives Ed. Wise a check for \$50 and also writes another for \$10 for personal use.

Dec. 31. Credits Ed. Wise with wages.

Jan. 12, 1917. Withdraws \$30 from the bank and spends all of

it while attending annual meeting of the State Board of Agriculture. (This is considered as a business rather than a pleasure trip.)

Jan. 22. Receives a check from the A. D. R. R. Co. for \$15.10 for his claim made in June for seed corn lost in transit.

Jan. 31. Credits Ed. Wise with wages.

Feb. 1. Pays taxes \$118.43.

Feb. 2. Gives Ed. Wise a check for \$10. He has the shoes sharpened on Jack and Jim, for which he pays \$1.40.

Feb. 7. Buys a bob sled, \$15, and also buys a ton each of bran, \$21; and middlings, \$24.

Feb. 10. Buys $4\frac{1}{2}$ bushels of clover seed for cash, at \$9 per bushel. (Debit 1917 clover crop.)

Feb. 15. Buys the 40 acres adjoining the Lone Tree Farm for \$82.50 an acre. He pays \$2000 in cash and The First National Bank loans him the balance at 5% on three years' time, agreeing to accept payment of the whole or any part of the principal on any interest paying date. He secures the bank by mortgage. (Credit Mortgage Payable account for amount borrowed, showing name of bank in explanation column. Debit Land for entire purchase price.)

Feb. 27. Pays for 2000 four-inch tile at \$12.50 a thousand. (Debit General Expense.)

Feb. 28. Credits Ed. Wise with wages.

Mar. 2. He gives Ed. Wise a check for \$20.

Mar. 9. He buys a pair of rubber boots for himself, \$4.50.

Mar. 20. Gives his check for 1000 feet of lumber, \$27, to be used in repairing buildings. (Debit Building Expense.)

Mar. 31. Credits Ed. Wise with wages.

Mar. 31. An inventory taken on this date resulted in the following aggregate amounts being shown as values of the various possessions:

Land \$18,300; Buildings have depreciated 5% during the year and equipment 10% of the value at the beginning. Horses, \$500; cattle, \$75; hogs, \$215; sheep, \$600; corn \$560; potatoes, \$20; clover hay, \$90; seed corn, \$30; fertilizer, \$30; 1917 timothy crop, \$10.60; 1917 clover crop, \$40.50; mill feed, \$74.10. The corn consists partly of that left after sorting seed for sale. The

household furnishings are valued at \$700. All tile purchased on Feb. 27 are still on hand; also the lumber bought on Mar. 20.

(a) Make all the entries for the transactions given above.

(b) Post all entries to the proper ledger accounts, ruling off cash journal.

(c) Take a trial balance immediately after posting the last transaction, before considering inventories.

(d) Considering inventories, prepare a Loss and Gain account in the ledger, and rule off the necessary accounts, bringing down balances or inventories whenever the nature of the account requires it.

(e) Take a trial balance after closing which may be used also as a list of the Resources and Liabilities as of March 31, 1917.

REVIEW QUESTIONS

1. Describe the method of recording the value of services of a hired man employed regularly, but drawing cash as wanted at irregular intervals.
2. What is the general principle governing debits and credits to Notes Receivable account?
3. What three methods of parting with a note receivable cause credit entries in the account?
4. Why must Notes Receivable account always have a debit balance, if any?
5. Is interest on notes included in the note account?
6. State two ways in which it can be determined whether a promissory note parted with is credited to Notes Receivable or Notes Payable account.
7. Why must Notes Payable account always have a credit balance if any?
8. What negotiable instruments are considered as cash rather than notes receivable or payable? How are mortgages treated in accounts?
9. What principles govern the debits to Land account when opening a set of books? When purchasing land? When inheriting land?

10. What items may be charged to Land account, that do not represent the actual amount paid for the land?
11. Discuss the charges to be made for fence or tile repairs under varying conditions.
12. Why is it not considered good accounting to record appreciation or depreciation of land in the books of account?
13. What is the nature of the entry to record a sale of land for more than the book value? For less than the book value?
14. Under what conditions is an account with buildings debited? When credited?
15. What is a mixed account?
16. Discuss the use of the Merchandise account in commercial accounting.
17. Why is the use of the mixed account considered by some as unscientific?
18. Name four reasons why objections to the mixed account do not apply in farm accounting.
19. What class of accounts on a farm are generally used as mixed accounts?
20. What entries are commonly made in the account with horses?
21. Discuss the advisability of keeping one account with work horses and one with other horses.
22. What is the nature of the entries in Swine account?
23. When is it better to keep separate accounts for dairy and beef cattle than to have them combined into one account?
24. What peculiarities exist in cattle raising that make it difficult to record transactions accurately as regards cost?
25. Make suggestions for keeping proper accounts when one is engaged in raising dairy cattle for the purpose of disposing of dairy products and also for selling dairy cattle, quite extensively.
26. Discuss the account or accounts required to record poultry operations. What advantage is there in keeping two accounts for poultry transactions?
27. Discuss briefly the recording of transactions in connection with sheep.
28. What accounts might be used to record transactions involving farm machinery and tools?

29. Make suggestions concerning transactions with tractors, corn shredders, threshing machines, and hay balers.
30. Discuss the nature of debits and credits recorded in corn, oats and wheat accounts.
31. What is the nature of the transactions requiring entries in the household account?
32. Why is the household account such an important one in farm accounting? Compare the business of farming with other classes of business in this respect.
33. Why is labor account debited with the value of food and lodging given to hired help?
34. Present two ways of making entries for labor of a permanent hired hand receiving board and lodging free, and drawing amounts of cash from time to time as needed.
35. How is labor performed by members of the household recorded?
36. Discuss the entries to show correct costs when a member of the household is paid a nominal amount in cash for his labor, but not an amount which he is really worth.
37. Discuss the entries for feed bought, when all used for the same class of livestock. When used for several classes.
38. How is commercial fertilizer recorded in the books?
39. What is an inventory? What accounts are affected by inventories?
40. How are accounts affected by inventories?
41. Which results in the showing of the larger gain in an account, a large inventory or a small inventory at the close of the year?
42. Does the large or the small inventory in an account at the beginning of a year result in the greater gain during the year, other entries being the same?
43. When an account is credited with the value of the inventory at the close of the year what account is debited? Discuss.
44. Is the credit for inventory at the close of a period made before or after taking the preliminary trial balance? Before or after the trial balance after closing?

45. Why does the entry for the inventory not have to appear in any book of original entry?
46. After closing inventory is properly recorded in an account what steps are necessary to complete the closing of the account?
47. Discuss the reason for debiting and crediting the same account with the inventory value.
48. How does a natural increase in livestock affect the loss or gain of the specific livestock account?
49. Illustrate the method of making the inventory and closing entries in an account that results in a loss.
50. Under what conditions is it unnecessary to record an inventory value in an account, although an inventory exists? Why?
51. What is the procedure in taking and recording a physical inventory?
52. What advantage is there in having a detailed inventory in comparative form?
53. What is the point of contact between the inventory record and the account?
54. How is general expense account affected by inventories?
55. How is the inventory record used in making the opening entries at the time of opening ledger accounts for the first time?
56. Why are dairy and general equipment kept separate in the inventory record and also in the ledger?
57. How is the value of equipment determined? How is it shown in the inventory record? Discuss the advantages of this method of valuation.
58. Why is it not necessary to find the aggregate total of all items listed in the inventory record?
59. State how taking an inventory is a method of calculating depreciation. What method is it called?
60. What is the straight line method of calculating depreciation? Illustrate.
61. What is the diminishing value method as used on the farm? Illustrate. Compare the two methods.

62. What debits and credits are expressed to record depreciation of equipment?
63. Discuss the principles governing depreciation of buildings.
64. What is the object of making closing journal entries?
65. Discuss the method and form of closing journal entries. Why are they always entered in the "sundry" column, even in the cash journal?

CHAPTER VII

SPECIAL ACCOUNTS AND ENTRIES (CONTINUED)

Fair Exhibits.—Considerable expense is incurred, and some income derived by some farmers as a result of exhibits of livestock and farm products at fairs. If a farmer has an exhibit of several commodities or groups, it would be advisable to open an account called "Fair Exhibits," to which is debited all expenses incurred in preparing and transporting exhibits, together with any entrance fees and cost of protection while at the fair. The account is credited with any income from the exhibits, except that income from the sale of the articles exhibited is credited direct to the livestock or farm produce accounts representing the articles sold. Any balance in the Fair Exhibits account is closed into Loss and Gain account, at the close of the year.

If one deals in one specialty that he exhibits largely at fairs, such an account would be opened as described above, but the balance would be transferred into the account representing the specialty. For example, a farmer specializing in Poland Chinas and exhibiting them, but nothing else, at fairs, keeps an account called "Poland China Exhibit." After all expenses and incomes of the exhibit are entered he transfers the balance to Swine account before finding the loss or gain on the latter.

Consignments.—Produce or livestock shipped or placed in the hand of someone else for sale on commission are known as consignments. The title in the goods remains with the consignor, who is the original possessor. The

possession of the goods, but not the title, is transferred to the consignee, who is the party receiving the goods for sale. The consignee is sometimes called the factor.

In recording consignments in the books of account no debits and credits are expressed in the books of the consignor at the time of sending the goods. He makes a memorandum in a notebook or in the back of the journal, indicating the quantities and nature of the products or livestock sent, to whom sent and any other facts concerning the terms of sale and so on. Any freight paid or other expense incurred in sending them is charged to the produce or livestock account under consideration.

When the consignee has sold the goods he usually remits in the form of cash or note. At such a time, when the cash or note is received, the debits and credits of the consignment are expressed. Cash account or Notes Receivable is debited and the proper produce or livestock account credited. This credit to the produce account is for the net amount after the consignee's commission and expenses have been deducted, as shown by the "Account Sales," the statement accompanying his remittance.

There are several methods of handling consignments, of which the one described is the simplest to operate but is not the most theoretically correct one.

The records from the viewpoint of the consignee do not interest the farmer, hence are not presented here.

Auction Sales.—No account with auction sales is necessary. The sale of each article is recorded as a credit to the property account affected. This does not mean that a separate entry is made for each article sold. Some items can be grouped in a single entry.

For example, the sale list kept by the clerk of the sale forms the basis for the entries. If one cultivator, two wagons, one hay rake and one walking plow are sold for \$110 cash, according to the clerk's record the entry is:

Cash.....	\$110.00	
Equipment.....		\$110.00

If the same equipment were sold for 10% cash down and a note for the balance, the entry would be:

Cash.....	\$11.00	
Notes Receivable.....	99.00	
Equipment.....		\$110.00

Presuming that the book value of the five articles sold is \$150, an entry is made as follows:

Loss on Auction Sale....	\$40.00	
Equipment.....		\$40.00

This entry reduces Equipment account to an amount representing the value of the equipment still on hand, and at the same time shows the loss due to the sale at auction.

The Loss on Auction Sale account is debited with loss from other classes of property also. For example, if five cows are sold at a price aggregating \$35 below their inventory or book value, an entry is made to show the result in this way:

Loss on Auction Sale....	\$35.00	
Cattle.....		\$35.00

Considering the last two entries above as being the only ones affecting the Loss on Auction Sale account, the entry to close the latter account is:

Loss and Gain.....	\$75.00	
Loss on Auction Sale		\$75.00

This entry transfers all losses due to the special auction sale direct to Loss and Gain account rather than permitting them to appear in the several property accounts at the close of the year. If they appeared in the property ac-

counts it would tend to indicate poor management, or that some property cost was excessive, when, as a matter of fact, the unusual event—the auction sale—was responsible for the loss.

Fire Loss.—Under this title is illustrated the method of handling the transactions incidental to loss of property of any sort by fire. The same treatment would apply in case of hail insurance, tornado insurance or livestock insurance.

As an example, assume a farm having a blanket fire policy on the buildings and contents amounting to \$5000. If the buggy and tool house burns, rendering all articles therein useless, the insurance adjuster calculates the amount of insurance money to which the loser is entitled.

For the purpose of recording the transactions on the books it is necessary to credit the Buildings account with the value of the building destroyed, credit Equipment account with the value of buggies and tools that were in the building and debit Fire Loss account with the sum of the two debits named. Credit Fire Loss account with the cash received from the insurance company, debiting Cash. If there was nothing else to consider, the balance of the Fire Loss account would now show a loss or gain, whose balance would be transferred to Loss and Gain account at the close of the year.

Quite often, however, in a case like the one cited, some of the remnants can be sold for junk, or there are parts from which salvage can be recovered. In such instances, the Fire Loss account is credited with the selling price of any salvage and debited with any expenses incurred in removing such parts from the ruins and disposing of them. If the recovered parts are retained for use on the farm, credit Fire Loss account and debit Equipment account. The latter account being credited with the total value of contents immediately after the fire, is now debited with any recovered and kept for further use.

If no insurance is carried the Fire Loss account is operated in the same way, except it is not credited with insurance recovered.

Death of Livestock.—Livestock deaths covered by insurance are treated in a way exactly similar to fire losses, discussed above.

An entry may or may not be made for loss of livestock at time of death when not insured. If it is not made at that time, the loss is reflected in the proper livestock account at the time of recording the inventory at the close of the year.

The only difference between the two methods is that in one case, the loss due to death will show in the account as a separate item; while in the other it will be merged in with all other items of expense and income contributing to the net loss or gain on that class of stock.

The difference in results under these two methods is brought out in Illustrations 31 and 32. Assume a swine herd with an inventory value of \$400 at the beginning of the year, and \$150 at the close. Consider that expenses of maintenance, charged to the account, amount to \$100, that sales amount to \$140, and that the farm value of hogs lost through cholera is \$200.

If no entry is made in the Swine account when the hogs are taken by cholera, the Swine account and the Loss and Gain account as far as affected by swine will appear as in Illustration 31.

If a credit entry is made in the Swine account at the time the hogs are taken by cholera, Loss and Gain account is debited. The two accounts would then appear as in Illustration 32.

Illustration 31 indicates a loss of \$210 in swine. It does not show what the result of the ordinary transactions was. Illustration 32 shows a loss of \$10 due to the ordinary

ILLUSTRATION 32

ACCOUNTS AFFECTED BY DEATH OF LIVESTOCK WHEN ENTRY
IS MADE AT TIME OF DEATH*Swine*

1916		1916	
Mar. 1 Inventory	\$400	Dec. 22 Cash sale	\$140
1917		1917	
Feb. 28 Expenses for yr.	100	Jan. 25 Died of cholera	200
		Feb. 28 Inventory	150
		Feb. 28 Loss and Gain.	10
			\$500
	\$500		
1917			
Mar. 1 Inventory down	\$150		

Loss and Gain

1917	
Jan. 25 Swine (cholera)	\$200
Feb. 28 Swine (operat- ing loss)	10

requires special consideration. The crops sold under contract are referred to. A beet sugar concern contracts at the beginning of the season for all the beets in a field at so much a ton, and agrees to furnish the labor for cultivation and harvesting. A similar agreement might be made concerning a field of cabbage, cucumbers, sweet corn, broom corn or other crops.

From the bookkeeping point of view no entries are required at the time the contract is made. The contract should be in writing in order to be enforceable and should be carefully preserved.

Since the labor for cultivation and harvesting is not employed by the farmer he does not have any entries to make concerning them. Under the cost method, however, the farmer would debit the beet field account with the labor and expenses connected with the preparation of the soil and the planting.

If the contract calls for cash on delivery of the beets, the simple entry for a cash sale is made, crediting Beets and debiting Cash. If, however, the payment is deferred until sometime later, the party buying the beets should be debited at the close of each day with the contract price of the beets delivered during the day. When he settles, he is credited and Cash debited.

Orchards.—For accounting purposes the orchard is considered in practically the same light as the annual crops. It has some peculiarities that must be reflected in the accounts in order to show proper results, but brings up few new problems.

The orchard is charged with all costs of clearing and preparing the soil, staking, purchase of nursery stock, planting, and all maintenance charges for the first four to seven years when it begins to yield. All expenses thus charged up to and including the first year of its yield are considered as adding to the value of the orchard. To these expenses are added interest¹ on the investment for the period mentioned. The resulting debit balance is the figure which is to be considered as the investment in the orchard during subsequent years. Any expenses after that time are to be considered as operating expenses to be offset against the income from the orchard for the year to find the yearly loss or gain.

In finding the loss or gain, an account called Orchard Expense and Income account is kept. To this is debited all expenses, after the first bearing year, such as cultiva-

¹ See Appendix for the rate of interest.

tion, care of trees, harvesting, and overhead charges, including interest on the investment for the year. It is credited with all income for the year from the fruit. The balance of the account is the net profit for the year and is closed into Loss and Gain.

This method of handling the items after the investment is found, leaves the investment intact in the Orchard account itself, which is carried as a resource from year to year until the orchard starts to depreciate. Orchard account is then credited and the Orchard Expense and Income account debited for depreciation. The time of this is quite indefinite,¹ peach trees having a bearing life of only about nine or ten years, while apple trees are about in their prime at that time, the twelfth to fourteenth year of their growth.

If it is desired to know which variety of fruit pays best it is necessary to keep detailed cost records. The one that sells for the highest price is not necessarily the one that pays best. Perhaps the last named variety requires more spraying, is more susceptible to frost, is more expensive in thinning, or in pruning, and that picking costs are increased because of the difficulty in finding sufficient color to class as Fancy or Extra Fancy. Detailed costs are required in order to state intelligently that one class or variety pays better than another. Such detail could be made profitable in large orchards, but not in the average orchard conducted incidentally with general farming operations.

Woodland.—The value of wooded land should be kept in an account by itself, and not classed with farm land until it is cleared for cultivation. The value at which it is placed on the books may be left indefinitely, since the removal of the wood is considered as making it more valuable for tillage. For this reason a Woodland Expense

¹ Oregon Agricultural College Experiment Station Bulletin No. 132.

and Income account should be established, to which is credited the wood charged to the household or sold for cash; also any income from pasturage. This expense and income account is charged with taxes and (under the cost method) with interest on the property.

When the land is cleared for tillage, the cost of grubbing and disposing of stumps is properly charged to the property account "Woodland" in order to arrive at its cost as tillable land. After it is cleared, the balance of the account is transferred to Land account.

Bees.—The operations of bees are recorded in the account bearing this title. It is charged with the inventory at the beginning and all expenses of operation; and is credited with the income and the inventory at the close of the period. Any balance remaining after these entries, is carried to Loss and Gain account.

The inventory, for purposes of this account, consists of the value of the hives, honey, and all apparatus maintained for special use in connection with the bee industry. Care should be exercised in valuing the swarm, on account of the uncertainty of its duration. A low nominal value, if any, should be used.

Partnership.—The form of the organization of an enterprise does not alter the principles of recording transactions except at the beginning of business and at the close of a fiscal period.

There have been only two principles presented up to the present subject that do not apply equally in a single proprietorship or in a partnership. Those two relate to the opening of the books at the beginning; and the closing entry.

In the case of a partnership, the opening entry credits the capital in two or more amounts depending on the number of partners. The closing entry credits each partner

with his share of the profits, or debits him with his share of the losses.

Opening Entry of a Partnership.—The opening entry of a partnership shows the resources brought into the business, the liabilities assumed, and the total investment of each partner, credited to his Capital account. For example, if A. B. Clay and Ike Laahre enter into partnership on a rented farm, the entries in Illustration 33 would indicate the amounts contributed by each:

ILLUSTRATION 33

PARTNERSHIP OPENING ENTRIES

A partnership agreement having been effected, we (A. B. Clay and Ike Laahre) today open a set of books by recording our respective investments in the firm of Clay and Laahre by the following entries:

March 1, 1917

Cash.....	\$1,000	
Equipment.....	500	
Note Payable.....		\$500
A. B. Clay, Capital...		1,000

March 1, 1917

Cash.....	\$1,000	
Horses.....	1,000	
Ike Laahre, Capital...		\$2,000

The entries of Illustration 33 indicate that Clay put in \$1000 net capital and Laahre \$2000. The capital of the business is therefore \$3000. In a partnership each partner has a capital account bearing his name. In the case at hand, A. B. Clay's Capital account is credited with \$1000 and Ike Laahre's with \$2000. In order to find the aggregate capital of the business conducted on a partnership basis, it is necessary to take the sum of the balances of the capital accounts.

Closing Entries of a Partnership.—After posting the opening journal entries, all subsequent entries are the same as for a single proprietorship until the Loss and Gain account is closed. With two owners instead of one, the entry closing Loss and Gain account assumes the form presented in Illustration 34.

ILLUSTRATION 34

PARTNERSHIP CLOSING ENTRY

Feb. 28, 1918

Loss and Gain.....	\$1,000	
A. B. Clay, Capital (or Drawing a/c)....		\$500
Ike Laahre Capital (or Drawing a/c)....		500

It is seen that there apparently was a profit of \$1000 as a result of the year's operations. One-half of this, or \$500, is credited to the Capital or Drawing account of each partner.

This procedure may seem strange in view of the fact that Laahre has twice as much capital invested as Clay. Why does he not receive credit for twice as much profit as Clay, or $\frac{2}{3}$ of the total profit? It is an established principle of law, that *in the absence of specific agreement between partners as to the distribution of profits and losses they shall be shared equally regardless of the capital invested*. If Laahre wants two-thirds of the profits because he has two-thirds of the investment, he should see that such a clause is stated in the partnership contract, commonly known as the articles of copartnership.

Interest on Partner's Net Capital.—It sometimes happens that one partner withdraws the amount of his profit at the close of the year while the other leaves his in the business. This results in the latter partner's contributing more to the working capital during the succeeding year. To help correct this condition of apparent inequality, in-

terest at 5% or 6% per annum is credited to the partners' accounts, based on the capital in the business during the year. This credit is offset by a debit to Loss and Gain account. For example, after posting the entries, shown in Illustrations 33 and 34, A. B. Clay's Capital account has a balance of \$1500 and Ike Laahre's of \$2500, presumably on March 1, 1918. If A. B. Clay withdraws the amount of his profit, \$500, his capital will be reduced to \$1000. This reduces the amount of capital available for the business, thereby possibly impairing some larger operations anticipated. In order to discourage such withdrawals, interest at 5% is allowed on capital remaining in the business throughout the year. In the case just cited, in which Clay has \$1000 and Laahre \$2500 left in the business at the beginning of the year, the entry for interest at the close of the year is as follows:

Loss and Gain.....	\$175	
A. B. Clay, Capital a/c.....		\$50
Ike Laahre, Capital a/c.....		125

Since losses and gains are shared equally, Clay's account will ultimately be debited with one-half of \$175 or \$87.50 as a result of the interest entry. That is, he loses \$37.50 ($87.50 - 50$) as a result of the interest agreement. Laahre gains the same amount.

Partners' Drawing Accounts.—A Drawing account is kept with each partner to serve as a substitute for the Household account which is not practical in partnership operations. Each one bears the name of a partner, as Mr. Clay's Drawing a/c, Mr. Laahre's Drawing a/c. These accounts receive all debits and credits affecting the partners during the year, such as debits for withdrawals of cash or produce for personal or household use, credits for wages or salaries, share in losses or gains, etc. At the close of the year it is customary to transfer an equal amount

from each Drawing account to the respective Capital accounts. This increases the capital of the business and keeps the Capital accounts equal. If capital is invested two-thirds and one-third, then the transfer from Drawing accounts is made so as to maintain that proportion. A provision should be made in the partnership agreement to the effect that no partner may draw more than a specified amount from the business until after it is definitely known what the net gain or loss is for the period. No partner should be permitted to draw an amount greater than his share of the gain.

Partnership Legal Difficulties.—There are a great many legal difficulties arising in partnership affairs. One should not enter into partnership with one whose honesty or integrity he has the least reason to question. The court decisions indicate that it is possible for one partner to incur debts for the partnership which the other partner might have to pay. It is a principle of law that any partner is liable for all the debts of the firm. If partner "A" borrows money in the name of the firm but uses it for his own interests, the lender may recover from the other partner, "B."

Partnership matters cause a great amount of business for lawyers. This is largely due to the fact that the articles of copartnership are not drawn up properly in the first place. Too many points are omitted or merely touched without proper elucidation. Some points that ought to be included in the partnership written agreement, in order to avoid unpleasant arguments later, are given below.

1. Specify what each is to contribute in value, naming specific articles of equipment, livestock, etc.

2. Duties of each—whether all time is to be spent in farming operations—whether one is to have full powers in handling swine or beef cattle while another one has

full powers in raising of products and so on. Also whether either is to draw a salary and if so, how much.

3. The amount which each may withdraw for personal use during a year without being charged with interest on such withdrawal.

4. Whether or not interest is to be credited on the net capital of each partner during the year.

5. In the case of interest charged on withdrawals or credited on net capital it should be specifically stated that all entries pertaining to interest should pass through Loss and Gain account. That is, if "A" is charged with interest on money withdrawn, the offsetting credit should be to Loss and Gain account. Likewise if "A" is credited with interest on net capital the offsetting debit should be to Loss and Gain account.

6. The conditions under which a partner may reduce or increase his capital otherwise than by the natural decrease or increase arising from loss or gain in business operations.

7. The sharing of profits, (a) whether to be shared in proportion to investment or otherwise, (b) whether cash in amount equal to the profits of the year must be withdrawn from the business.

8. In case the family of one of the partners lives in the farm house but the other partner is unmarried, or lives away from the farm house, the articles of copartnership should specify just what charge is to be made to the partner occupying the house and using farm products.

9. If one partner contributes land, buildings and equipment without doing any work and the other one supplies all labor, sharing profits in some proportion usually other than half and half, specific arrangement should be made for determining what the laborers should do. For example, the partner owning the buildings might want the laborers retained in a slack time to assist in erecting a new building, a new fence or in tilling a field. The partner

paying for the labor might refuse to pay the laborers for that class of work on the ground that he was to pay only the wages necessary to operate the farm, and not for the purpose of adding to the wealth of the first partner.

10. The period of the partnership should be definitely stated and the terms of dissolution—whether each is to take the specific equipment and livestock he invested as far as practicable, or whether he is to take an equivalent value regardless of the units of property. Provision for renewal of agreement might be made.

11. If one partner, an expert in his line, is to receive a commission based on the “profit” from beef cattle, for example, the articles of copartnership should define the word “profit” stating whether it is to be determined after considering all charges for feed, labor, depreciation of equipment, proportion of general expense, interest on investment and so on as calculated under the cost system, or whether it merely means selling price minus a fair estimate of time and feed used.

12. It is advisable for the articles of copartnership to state what system of accounting shall be used—whether or not cost records are to be employed.

Dissolution of Partnership.—In dissolving a partnership the resources are divided in proportion to the capital accounts, after distributing profits or losses up to the date of dissolution. Illustration 35 shows a trial balance after closing, at Feb. 28, 1917, just before dissolution. It also shows the journal entry made upon dissolution.

By posting the entry shown, all accounts in the ledger are closed. The transaction supporting this entry was the distribution of the physical property, in such a way that Emery got \$2800 of it and Hopkins \$1800. It does not show who took the horses and cattle, or whether they were distributed equally. That is a matter of agreement which does not require reflection in the books. The entry

ILLUSTRATION 35

ENTRY UPON DISSOLUTION OF PARTNERSHIP PREPARED FROM
TRIAL BALANCE AFTER CLOSING*Trial Balance After Closing Feb. 28, 1917*

Cash.....	\$2,000	John Emery Capital ...	\$2,800
Equipment.....	600	Chan Hopkins Capital .	1,800
Horses.....	1,000		
Cattle.....	1,000		
	<hr/>		<hr/>
	\$4,600		\$4,600
	<hr/>		<hr/>

Entry of Dissolution

John Emery Capital.....	\$2,800	
Chan Hopkins Capital.....	1,800	
Cash.....		\$2,000
Equipment.....		600
Horses.....		1,000
Cattle.....		1,000

for closing by a single proprietor is exactly similar, except that one capital account is involved instead of two.

Share Rent.—From the tenant's point of view, renting on shares causes some modification in the details of the bookkeeping entries. A contract or lease for rental on shares does not create a partnership. The relation between landlord and tenant is not that of partners. So much depends upon the terms of the lease that few rules can be given for the making of specific entries. Some leases contain provisions for part cash rental in addition to a specified share of the gross income from sales. Leases also differ as to the property to be supplied by the tenant, and as to who shall meet certain classes of expenditure. Leaving the discussion of the effect of share rent on costs for

treatment under Rent Distribution in Chapter IX, a simple case is presented here to indicate the effect of share rental on the accounts of the tenant.

Effect of Share Rental on Accounts.—Assume for this purpose that the landlord furnishes land and buildings and one-half of all working resources such as livestock and equipment. Assume also that the tenant pays all operating expenses except insurance, taxes and repairs on land and buildings, and that all products and livestock sold from the farm are divided equally between landlord and tenant. With these conditions, the Capital account, resources and liabilities of the tenant only are shown in the tenant's ledger. All expenses are charged to the appropriately named accounts as in other cases. No property of the landlord is recorded in the books of the tenant.

Under the conditions cited in the preceding paragraph assume that the tenant A and landlord B together own \$300 worth of swine at the beginning of the year, that there are sold from the farm \$1000 worth during the year and that the inventory value of the drove at the close of the year is \$200. Such conditions would cause A's Swine account to appear as in Illustration 36.

The Swine account of tenant A in this case records only one-half each of the total value of the beginning inventory, the sales and the closing inventory. In Illustration 36, for example, A's Swine account is debited with \$150 as the beginning inventory. It shows the value of swine belonging to A without attempting to show the value of swine on the farm. Similarly the inventory at the close of the year shows only one-half the total value of all swine on the premises. The sales of \$500 recorded on the credit side of the Swine account in question represent only A's share of the total income of \$1000 from the sale of swine during the year. As a result of these transactions in swine during the year, A's Swine account

ILLUSTRATION 36

TENANT'S SWINE ACCOUNT UNDER SHARE RENT METHOD

Swine

1916		1917	
Mar. 1 Inventory.....	\$150	Feb. 28 Sales per cash	
		journal.....	\$500
1917		Feb. 28 Inventory.....	100
Feb. 28 Net Gain.....	450		
	<u>\$600</u>		<u>\$600</u>
1917			
Mar. 1 Inventory.....	\$100		

shows a net gain of \$450 to be transferred to the Loss and Gain account.

This gain is not the gain resulting from the raising of swine on this particular farm. It is only A's share of the gain. Likewise the net gain or loss shown by the Loss and Gain account reflects only A's loss or gain and does not show what result is obtained from the operation of the farm as a whole.

No Rent account is used under the principles described above. The rent for a given year is equal to the gross income from the productive elements as shown by their accounts.

Inventory Record in Share Rental.—Although "A's" accounts are affected only by his share in the operations, under share rental, the inventory record shows all the property on the farm, just as it does under any other conditions. This enables a better check to be maintained on the various units of property, and affords a means of determining the total value of the possessions of landlord and tenant. When inventory values are recorded in the

ledger of A, only his share of the total value of the several classes of property is used.

Cash Rent.¹—There are few of the share rent accounting difficulties that arise when a tenant pays rent wholly in cash. Under the cash rent method of operation, the tenant charges Rent account with the stipulated amount of rent for the year. The corresponding credit is to cash or the proprietor's personal account or Notes Payable account depending on the method of payment, or whether payment is completed before the close of the year.

Operation of More Than One Farm.—The farmer who owns and operates more than one farm should attempt to keep a separate set of accounts and records for each farm. He should make arrangements to have them kept on the same basis as far as possible. This uniform basis permits comparative statements to be made at the close of the year presenting the relative operating results of each farm. The details of operation can not be worked out without first giving due consideration to the operating conditions. If horses and equipment are kept on one of the farms to operate the others, and all are under one management, it does not pay to consider the farms as separate operating units. They should be considered as one farm. When the several farms are operated by different managers and each farm is a complete operating unit in itself, each one should have accounts of its own.

The owner of such farms keeps a private ledger, and cash journal or similar records, into which he carries the net profit from each of the several farms after it has been determined at the close of the fiscal year.

Form of Increased or Decreased Wealth.—In addition to the Loss and Gain Statement and Statement of Resources and Liabilities, there is a statement sometimes prepared at the close of a fiscal year showing the form as—

¹ See also Rent Distribution, Chapter IX.

sumed by the increased or decreased wealth. It shows what has become of the profits or what resources and liabilities the losses affected. This statement, which contains four money columns, is called the Change of Wealth Statement. It indicates in the first two columns the resources and liabilities at the beginning of the year and at the close. These amounts are used as a basis for calculating the amounts in the third and fourth columns showing the increase or decrease in each kind of resource and liability.

An example showing the form and characteristics of this statement is presented in Illustration 37.

From a perusal of the statement one finds that Mr. Bartlett's gain for the year ended Feb. 28, 1917, was \$1123.40. As previously learned, this means that the resources have increased or the liabilities decreased that much during the year; or some equivalent combination of increases and decreases of resources or liabilities has taken place. It is usually the latter, but one cannot tell which it is from the loss and gain balance as found in the Loss and Gain Statement. The Change of Wealth Statement analyzes the changes.

The Summary and Proof show that some resources have been increased by \$420, others decreased by \$296.60, leaving a net increase in resources of \$123.40. If a man's net earnings are \$1123.40 during a year, while he has only \$123.40 more in property at the close of the year, it follows that the remaining amount must have gone to reduce his liabilities to outsiders. This is exactly the result indicated by the Summary and Proof in Illustration 37.

If it is desired to look further, to find out just what resources decreased or increased during the year or what liabilities decreased, the information can be found in the "increase" and "decrease" columns of the Change of Wealth Statement.

These increases and decreases should not be misinter-

ILLUSTRATION 37

CHANGE OF WEALTH STATEMENT
 YEAR ENDED FEB. 28, 1917—J. A. BARTLETT

Resources

	Feb. 29, 1916	Feb. 28, 1917	Increase	Decrease
Cash.....	\$500.00	\$343.40		\$156.60
Horses.....	2,200.00	2,160.00		40.00
Cattle.....	1,000.00	1,020.00	\$20.00	
Swine.....	600.00	600.00		
Corn.....	800.00	900.00	100.00	
Oats.....	300.00	250.00		50.00
Equipment...	600.00	550.00		50.00
Hay.....		300.00	300.00	
	<u>\$6,000.00</u>	<u>\$6,123.40</u>	<u>\$420.00</u>	<u>\$296.60</u>

Liabilities

Mtge Payable.	\$2,000.00	\$1,000.00		\$1,000.00
J. A. Bartlett				
Cap. a/c...	4,000.00	5,123.40	\$1,123.40	
	<u>\$6,000.00</u>	<u>\$6,123.40</u>	<u>\$1,123.40</u>	<u>\$1,000.00</u>

Summary and Proof

Increase in resources.....	\$420.00
Less decrease in resources.....	296.60
	<u>Net increase in resources.....</u>
	\$123.40
Add decrease in liabilities to outsiders.....	1,000.00
	<u>Increase in liabilities to the proprietor, being the</u>
net gain for the year as transferred from Loss and	
Gain account.....	\$1,123.40

puted to mean that the respective branches of operation have caused losses or gains represented by their increase or decrease in value. For example, oats show a decrease of \$50 in Illustration 37. This means that Mr. Bartlett had \$50 worth less oats at the close of the year than at the beginning. It is the difference in inventories on the two dates. During the year he might have harvested 2000 bushels but sold most of them at a profit of \$500, leaving less on hand than at the beginning.

A comparison of the Change of Wealth Statement with the principles presented in pages 5 and 6 under the title "Comparison of Statements" will tend to indicate the similarity of principles involved.

Profit as Farmer and as Individual.—*Since the books of the farmer include household expenses and all personal items of expense or income under the title "Household" account, it is necessary to prepare a brief supplementary statement in order to show the net results for the year from the farm and also the net gain or loss as an individual. Such a statement is called a Farm and Individual Income Statement.*

Illustration 38 presents a statement of the type just mentioned.

ILLUSTRATION 38

FARM AND INDIVIDUAL INCOME STATEMENT
(HOUSEHOLD ACCOUNT SHOWING A LOSS) YEAR ENDED FEB. 28, 1917

C. E. Rightor

Net Gain as an individual, as per Loss and Gain account	\$700.00
Add Household Expense, as per Loss and Gain account	800.00
	<hr/>
Net Gain as a farmer	\$1,500.00
	<hr/> <hr/>

The figures used in deriving the \$700 are the same ones that are found in Mr. Rightor's Loss and Gain account at

the close of the year. The Loss and Gain account in the ledger must contain as a debit item any net expenses transferred from Household account in order to keep the ledger in balance, and to show the expenses of all kinds on the premises. In the case at hand he made \$1500 as a farmer, but his personal and household net expenses amounted to \$800 during the year, leaving him only \$700 better off as an individual at the close than at the beginning of the year.

It sometimes happens that the household account shows a credit balance after considering inventory, due to the fact that the Household is credited for the value of labor of the proprietor and other members of the family, which credit exceeds the charges to the Household for farm products, groceries and other living expenses. In such a case, the Farm and Individual Income Statement appears in the form shown in Illustration 39.

ILLUSTRATION 39

FARM AND INDIVIDUAL INCOME STATEMENT (HOUSEHOLD ACCOUNT SHOWING A GAIN) YEAR ENDED FEB. 28, 1917

Wm. E. Thompson

Net Gain as an individual, as per Loss and Gain account	\$500.00
Less Household credit balance.....	200.00
	<hr/>
Net Gain as a farmer.....	\$300.00
	<hr/> <hr/>

The statement of Illustration 39 indicates that Mr. Thompson's Loss and Gain account showed a gain of \$500. On the credit side of the Loss and Gain account there was apparently an item of \$200 transferred from Household account. The \$500 balance, therefore, was not the true gain of the farm. The household had "donated" \$200 worth of services, board and other values over the cost of

maintaining the household. Deducting this so-called donation leaves \$300 as the income from the farm proper.

Conditions arise occasionally which result in a greater credit balance in Household account than the total gain shown by the Loss and Gain account. Under such conditions the statement would be presented as in Illustration 40, with the farming operations showing a loss.

ILLUSTRATION 40

FARM AND INDIVIDUAL INCOME STATEMENT
(HOUSEHOLD GAIN MORE THAN INDIVIDUAL GAIN)
YEAR ENDED FEB. 28, 1917

Fred Trumbull

Household credit balance as per Loss and Gain account	\$360.00
Less Net Gain as an individual as per Loss and Gain account.....	100.00
	<hr/>
Net Loss as a farmer.....	\$260.00
	<hr/> <hr/>

The figures presented in Illustration 40 show that Mr. Trumbull's Loss and Gain account had a credit balance of \$100, indicating a gain of that amount as an individual. This was obtained after considering as a gain the \$360 "donated" by the household in excess of the cost of operating the household. Accordingly, the operations of the farm show a loss of \$260 for the year.

ILLUSTRATIVE PROBLEMS

1. J. W. Warner, a tenant farmer, decides to keep a double entry set of accounts beginning March 1, 1917, using a cash journal and ledger. He also keeps an inventory record, but no entries need be made in it by the student, thus reducing the details of the problem. Special cash-journal columns are as

follows: Household Dr., Cash Dr., Sundry Dr., Sundry Cr., Cash Cr.

He values his possessions at that time and finds them to consist of the following: Equipment, \$800; horses, \$750; cattle, \$230; hogs, \$480; corn, \$1260; oats, \$333; rye, \$93; hay, \$256; straw, \$225; a note signed by J. M. Walsh for \$150; lot 2, block 6, original town of Sumter, \$1400; 3 shares of stock in the Home Telephone Co., at \$92 a share; and cash on hand and in the bank, \$320. He owes \$500 on a note in favor of the Norton Farm Machinery Company, and \$20 to James White for wages.

Make the necessary entries for the opening of the books and also for the interpretation of the following transactions in the books.

Note.—Debit Home Telephone Co. Stock and Lot 2, Block 6, Town of Sumter accounts, with the value of these respective properties.

March 17. Paid cash for repairs to machinery \$6.

March 20. Paid Norton Machinery Company \$250 on account of note.

March 20. A contract is made whereby thirty acres of sugar beets soon to be planted are to be sold to Johns & Jordan at \$8 a ton when harvested. Johns & Jordan are to furnish all the labor for cultivating and harvesting the beets and deduct \$15 per acre for such services from the value of the beets at time of settlement.

March 21. Paid taxes on lot 2, block 6, \$8.46; and personal property taxes, \$25.10. (Debit General Expense \$33.56.)

March 24. Sold some hay for \$105 cash.

April 19. Paid special assessment tax on lot 2, block 6, for paving the street, \$5.30. (This is considered as increasing the value of the lot.)

April 20. Paid James White, \$20.

May 1. Received cash from J. M. Walsh to redeem his note, and to pay \$2.25 interest thereon.

May 31. Paid for labor, \$25.50.

May 31. Sold some corn for \$260 cash.

June 25. Sold some rye for \$69 cash.

June 26. Paid Norton Machinery Company balance due on note and \$9.20 interest.

June 27. Horse, Dexter, killed by lightning, valued at \$125.

June 30. Sold dairy products for cash during the month, \$27.50.

June 30. The household consumed dairy products, during the four months, valued at \$28.60.

July 8. Paid for labor \$21.40.

Aug. 18. Paid \$10 exhibit fee for fruits and crops at County Fair.

Aug. 31. Paid cash for household supplies \$25 and clothing \$25.

Aug. 31. Paid for sundry repairs to equipment \$19.40.

Aug. 31. Received \$15 in prizes at County Fair.

Sept. 10. Paid for labor \$24.

Oct. 10. Delivered 200 tons of sugar beets to Johns & Jordan under contract of March 20.

Oct. 19. Sold some hogs for \$116 cash.

Oct. 19. Delivered 100 tons of sugar beets to Johns & Jordan.

Oct. 31. The household consumed dairy products during the four months, valued at \$35.35.

Nov. 1. Received a check from Johns & Jordan in full of account.

Nov. 9. Traded black mare, Bess, for bay mare, Queen, and received \$20 to boot. (Dr. Cash, Cr. Horses for \$20.)

Dec. 19. Paid \$45 for sundry household commodities.

Jan. 16, 1917. Sold some corn for \$640 cash.

Jan. 18. Paid for labor, \$45.

Feb. 10. Leased a smaller farm for next year. The auction sale held today resulted in the sale of some of the equipment for \$150, at a loss of \$75 on the inventory valuation; one horse for \$100 at a loss of \$25; 10 hogs for \$200, a fair market price; some corn for \$150, market price; and rye for \$125, market price. All of the sales were for cash except the hogs which were sold to John Logan in exchange for his 90-day promissory note bearing 5% interest. The expenses of the sale amounted to \$35, which were paid in cash. (The latter is a charge to the Loss on Auction Sale account.)

Feb. 14. Buggy shed burned, in which \$300 worth of equipment was rendered useless. (Building loss does not affect the tenant.)

Feb. 18. Sold remnants of the equipment damaged by fire for \$30 cash.

Feb. 28. Received a check from the insurance company for \$250 to reimburse for damage from the fire of Feb. 14.

Feb. 28. Paid rent for the year in cash, \$550.

Feb. 28. The inventory taken at this date was valued as follows: Equipment, \$295; horses, \$530; cattle, \$270; hogs, \$545; corn, \$1030; oats, \$300; hay, \$190; and straw, \$225.

(a) Post all entries to the ledger, including totals of all but the Sundry columns.

(b) Take off a trial balance before considering inventories.

(c) Considering inventories, prepare a Loss and Gain account, close its balance into Capital account and rule off the accounts, bringing down inventories below the rulings.

(d) Prepare a trial balance after closing, which may be considered also as a Statement of Resources and Liabilities, as at Feb. 28, 1918.

(e) Prepare a Farm and Individual Income Statement for the year ended Feb. 28, 1918.

(f) Prepare a Change of Wealth Statement at Feb. 28, 1918.

2. On Jan. 1, 1917, Frank Anderson took a complete inventory of his farm and found he had the following, which are to be entered in the comparative inventory record except land, buildings, notes receivable, etc.: 194 A. of land valued at \$19,400; dwelling, \$2500; tenant house, \$1000; 1 new barn, \$1000; 1 old barn, \$200; 1 poultry house, \$80; 1 smoke house, \$40; 1 wood shed, \$10; 150 bu. wheat at \$1.70; 600 bu. oats at \$0.50; 100 bu. corn at \$1.20; 55 T. clover and timothy hay in barn at \$12; 15 T. clover and timothy hay in stack at \$12; 7 T. oats straw at \$6; 10 T. wheat straw at \$1.50; 1 grain binder, \$70; 1 cultivator, \$24; 2 walking plows at \$5 each; 1 corn planter, \$24; 1 cultivator, \$15; 1 mower, \$20; 1 riding plow, \$18; 1 riding plow, \$22; 1 steel roller, \$16; 1 broadcast grass seeder, \$1; 1 old sulky rake, \$1; 1 double harpoon fork, rope, etc., \$7; 2-6" Diamond plows, \$2.50; 1 manure spreader,

\$40; 1 harrow, \$1; 1 14-disc harrow with truck, \$12; 1 2-sec. steel spike-tooth harrow, \$5; 2 double shovel plows, \$2.50; dairy tools, \$7; 1 wagon, \$10; 1 road cart, \$10; 1 wagon, \$25; 1 carriage, \$50; 1 single top buggy, \$40; 1 four-cylinder automobile, \$400; 1 feed grinder, \$12; miscellaneous equipment, \$15; 1 Fairbanks stock and wagon scales, \$25; 1 road drag, \$1; 1 lawn mower, \$4.50; 1 wheelbarrow, \$1; 1 small galvanized tank, \$1.50; 1 pr. dehorning clippers, \$3.50; 3 sets double work harness, \$45; 1 set double carriage harness, \$18; 2 sets single buggy harness, \$18; 2 saddles, \$18; robes and dusters, \$2; halters, \$12; fencing tools, \$2; garden tools, \$4; ditching tools, \$0.75; barn tools, \$7; shop and repair tools, \$10; miscellaneous tools, \$10; 8 head horses \$1165 and 6 head mules, \$810; 15 head cattle, \$585; 35 hogs, \$580; 70 chickens, \$50; 60 T. ground limestone, \$120; miscellaneous supplies, \$2 (Charge General Expense); notes receivable, \$465; (John Pals' note without interest due March 1, 1917);

His liabilities were as follows: 6% mortgage, \$4000 interest payable Jan. 1¹ and July 1; note payable without interest to Jake Dillon, \$100; owing to Johnson Bros. on account, \$25.

He decides to keep a double entry set of books. Determine his present worth and open his books, using cash journal, ledger, and comparative inventory record. Cash journal columns are: debits: Frank Anderson Drawing, Fred Anderson Drawing, Cash and Sundry; credits: Sundry and Cash.

His transactions are as follows:

Jan. 1. Fred Anderson, the proprietor's married son, who has saved some money while working in the city enters into partnership with his father for the term of one year from today. The terms of the copartnership agreement contain among others the following provisions:

- (a) Fred is to invest \$1000 in cash,
- (b) He is to rent the tenant house and garden plot for \$60 for the term of one year, said rental to be an income of the elder Anderson and not of the business.

¹ Frank Anderson has given his personal check to pay the interest due today (January 1), so it is not necessary to consider interest in the entry made at this time.

(c) Before distributing the gain or loss for the year, an entry is to be made debiting Loss and Gain and crediting the Partners' Drawing accounts with 5% interest on the respective investments of the two partners.

(d) Labor account is to be debited and each partner credited in his drawing account at the close of the year with \$600 for labor during the year.

(e) Each partner may draw from the business for private use, cash or produce to the value of \$600 during the year.

(f) Either partner drawing more than \$600 in cash and produce the year shall be charged with 5% interest for the elapsed time on the excess withdrawals, Loss and Gain being credited.

(g) Depreciation at 5% per annum shall be charged to Loss and Gain account on all buildings and 10% on all equipment before distribution of profits.

Note.—The terms of the copartnership agreement as given above do not require an entry until transactions are stated.

Jan. 1. Fred Anderson invests \$1000 cash in the business according to the terms of the partnership contract.

Jan. 3. There was sold to the Jones Elevator Co. on account, 75 bu. wheat at \$1.70.

Jan. 10. Sold for cash 5 T. oats straw at \$6.

Jan. 20. Frank Anderson withdrew cash for life insurance, \$34.82.

Jan. 25. Received a check from the Jones Elevator Co. for wheat sold them on the 3rd.

Feb. 3. Sold to Sam'l McNulty on account 15 hogs for \$300.

Feb. 6. Each of the partners withdrew \$30 for personal use.

Feb. 24. Sold to Andrews & Johnson on account oats, \$150.

Mar. 1. Received \$465 from John Pals to redeem note due today.

Mar. 15. Sold to Jones Elevator Co., on account 75 bu. wheat at \$1.75.

Mar. 18. Sold for cash 1 T. oats straw at \$6.50.

Apr. 5. Frank Anderson used dairy products valued at \$25 and eggs and poultry valued at \$10 during the first three months, while Fred's family used dairy products valued at \$20 and eggs and poultry valued at \$5. (Debit the Drawing accounts.)

Apr. 28. Received from Sam'l McNulty check for \$200 to apply on account.

May 1. Fred paid his father \$30 to apply on rent of tenant house (no entry is made for this, since it is a side transaction, not affecting the cash of the business).

May 15. A new cultivator is bought of Anson & Co. for \$35 cash.

May 20. Paid for repairs on mower, \$5.

May 25. Paid Johnson Bros. \$25 in full of account.

May 28. Frank withdrew \$100 for private use and Fred \$80.

June 7. Received a check from Andrews & Johnson in full of account.

June 12. Received check from the Jones Elevator Co. in full of account.

June 18. Paid a note owing to Jake Dillon, \$100.

June 30. During the past three months, Frank's family has used dairy products, \$30; poultry products, \$10; garden truck, \$10. Fred's family has used dairy products \$25; poultry products, \$12, and garden truck, \$8.

July 1. Paid \$120 interest on mortgage, and \$1000 on the principal.

July 30. Frank withdrew \$75 for personal use and Fred \$50.

July 31. Paid wages in cash, \$46.50.

Aug. 18. Sold for cash 200 bu. wheat at \$2.

Aug. 25. Sold 58 T. hay at \$15 to Alberts and Casey on account.

Aug. 28. Bought a farm tractor for \$300 cash.

Sept. 3. Received check from Alberts and Casey for \$400 to apply on account, and a 60-day 6% note for \$470.

Sept. 30. Frank's family used during the last three months dairy products valued at \$20, and poultry products, \$7; Fred's family used dairy products, \$13, and poultry products, \$8.

Sept. 30. Frank withdrew \$250 for private use and Fred withdrew \$100.

Oct. 28. Sold to the Jones Elevator Co. for cash 200 bu. corn at \$1.25.

Nov. 2. Received check from Alberts and Casey for \$474.70 for note and interest due today.

Nov. 6. Sold for cash 50 tons of hay at \$13.

Nov. 25. Sold some hogs for \$780 cash.

Nov. 30. Frank withdrew \$300 for private use and Fred withdrew \$50.

Dec. 12. Paid carpenters for addition to barn, \$390.

Dec. 16. Fred paid the balance of \$30 rent on tenant house. (Same as transaction of May 1.)

Dec. 31. Frank's household used during the last three months dairy products valued at \$30 and poultry products valued at \$15. Fred's household used dairy products valued at \$20 and poultry products valued at \$15.

Dec. 31. (a) Post all entries to the ledger, including totals of all but the Sundry columns.

(b) Make the calculations and entries necessary to carry out the provisions of the copartnership agreement which have been designated in this problem under date of Jan. 1 as (c), (d), (f) and (g).

(c) Post the entries made under (b) above.

(d) Take off a trial balance before considering inventories.

(e) Make the proper entries in the Comparative Inventory Record, considering the following facts:

All items of equipment on hand at the beginning of the year were on hand at the close. In addition, any new equipment bought during the year is to be considered.

Products on hand were as follows: Wheat, 200 bu. at \$1.60; oats, 500 bu. at \$0.50; corn, 200 bu. at \$1.10; timothy hay, 20 tons, at \$10; oats straw, 10 tons at \$6; wheat straw, 10 tons at \$2.

Livestock inventory was as follows: Horses, 9 head, \$1230; mules, 6 head, \$810; cattle, 17 head, \$660; 30 hogs, \$480; 90 chickens, \$65. There were 30 tons ground limestone, \$60.

(f) Considering inventories, prepare a Loss and Gain account, close its balance into Drawing accounts, and rule off the accounts, bringing down inventories below the ruling when necessary.

(g) Prepare a trial balance after closing which may be considered also as a Statement of Resources and Liabilities as of Dec. 31, 1917.

(h) Prepare a Change of Wealth Statement as of Dec. 31, 1917.

(i) If the partnership is not to be renewed, and Fred Anderson withdraws, how might settlement be effected? Show the entry in simple journal form that would be required to record the withdrawal of Fred Anderson.

3. Mr. L. E. Fay, who has been farming for several years as a tenant, decides to keep accounts of his transactions. Accordingly, he arranges to use a cash journal and ledger, beginning with his new lease, on Jan. 1, 1916. The following columns are to be used in the Cash Journal in the order named:

Debit: Labor, Roy Wade, Household, Cash, Sundry.

Credit: Sundry, Cash, Household, Roy Wade, Poultry and Cattle.

He valued his possessions and prepared a Statement of Resources and Liabilities, as follows:

STATEMENT OF RESOURCES AND LIABILITIES, JAN. 1, 1916. L. E. FAY

<i>Resources</i>		<i>Liabilities</i>	
Cash.....	\$800	Watt. Hdw. Co.....	\$150
Household Furnishings..	500	Mortgage Payable.....	2,000
B. E. Adams.....	60	L. E. Fay, Capital.....	3,430
Notes Receivable (At- wood).....	200		
Horses.....	800		
Cattle.....	600		
Hogs.....	350		
Sheep.....	150		
Poultry.....	30		
Bran, shorts, etc. (Dr. Mill feed).....	40		
Corn.....	500		
Oats.....	100		
Wheat.....	250		
Hay.....	200		
Equipment.....	1,000		
	<hr/>		<hr/>
	\$5,580		\$5,580
	<hr/>		<hr/>

In order to reduce the details of the problem, the inventory record of Mr. Fay is not to be used.

Make the necessary entries in the book of original entry to open the books of Mr. Fay; and then proceed to record his transactions for the year, as detailed below:

Jan. 2. Gave two promissory notes to landlord for \$250 each in payment of year's rent, one due Sept. 1 and one Dec. 15, 1916, without interest. (Debit Rent account.)

Jan. 9. Spent \$10 for household supplies.

Jan. 10. Sold corn for \$140 cash.

Jan. 31. The household received during the month \$5 worth of dairy products and \$1 worth of eggs. (Credit Cattle and Poultry accounts respectively).

Jan. 31. Butchered, for household use, four hogs valued at \$50.

Feb. 1. Paid interest on mortgage for six months, \$60. (Keep an interest account.)

Feb. 11. Bought for cash two horses at \$150, and two sets of harness at \$19.50. (Harness is considered as equipment.)

Feb. 16. Received a 60 day note, bearing interest at 6%, from B. E. Adams to settle his account.

Feb. 28. The household received during the month, poultry valued at 90c, eggs valued at \$1.15, and dairy products valued at \$6.

Mar. 4. Sold wheat for \$175 cash.

Mar. 4. Paid cash for groceries, \$6.

Mar. 4. Paid personal taxes, \$35.67.

Mar. 31. The household received during the month, poultry valued at 95c, eggs valued at \$1.10, and dairy products valued at \$6.40.

Apr. 3. Paid for repairs to wagon and corn planter, \$2.25.

Apr. 16. Received cash from B. E. Adams to redeem his note of Feb. 16¹ and to pay interest on same.

Apr. 30. The household received during the month, poultry valued at 80c, eggs valued at 90c, and dairy products valued at \$5.30.

May 1. Arranged with Roy Wade to work by the month until

¹ In figuring 60 days from February 16, it should be remembered that 1916 was a leap year.

December 1, for \$30 a month and his board, room and laundry. It is agreed that he can draw his wages in installments of not less than \$5 at any time after he has earned them.

May 5. Received cash from A. M. Atwood for note due today, with interest on same at 6% per annum from Dec. 5, 1915.

May 6. Paid Watt Hdw. Co. in full of account, \$150.

May 25. Decided to discontinue the raising of sheep, so sold all the sheep for \$230 cash.

May 25. Roy Wade drew \$10 on account of wages.

May 31. Sold part of the hay for \$95.

May 31. The household received during the month, poultry valued at 70c, eggs valued at \$1.30, and dairy products valued at \$7.

May 31. Credited Roy Wade with wages for May, \$30.

May 31. The household values the board, room, and laundry of the hired man during May, at \$20.

June 1. Paid \$30 for bran and shorts.

June 8. Roy Wade drew \$20 on account.

June 10. Bought sundry supplies for the house, \$16.50, of which \$13 was paid in cash, \$2.50 in butter, and \$1 in eggs. (The Household is credited for butter and eggs sold since it is debited with all milk and eggs produced on the farm.)

June 10. Bought nails, bolts, etc., for repair of equipment, \$1.15 cash.

June 10. Bought a new hat and suit of clothes for \$27.50 cash.

June 30. The household received during the month, eggs valued at 50c and dairy products valued at \$5.60.

June 30. Credited Roy Wade with wages for June, \$30.

June 30. The household values the board, room, and laundry of the hired man during June at \$20.

July 3. Paid for binder twine for oats crop, \$19.50.

July 3. Roy Wade drew \$30 on account.

July 4. Spent \$7.40 for sundry expenses in town at holiday celebration.

July 8. Deposited \$500 in savings account at State Trust and Savings Bank. (Debit State Trust & Savings Bank, Credit Cash.)

July 15. Paid for extra help during the haying season, \$9.30.
(Dr. Labor.)

July 22. Bought groceries for cash, \$16.

July 31. The household received during the month, eggs valued at 35c, and dairy products valued at \$3.40.

July 31. Credited Roy Wade with wages for July, \$30.

July 31. The household values the board, room, and laundry of the hired man during July at \$20.

Aug. 1. Paid interest on mortgage, \$60.

Aug. 6. Paid for sundry small tools, \$6.30.

Aug. 16. Paid for threshing coal for oats crop, \$4.27.

Aug. 18. Sold 520 bushels new oats at 53c cash.

Aug. 23. Sold some corn for \$150 cash.

Aug. 23. Bought groceries for cash, \$19.50.

Aug. 31. The household received during the month, eggs valued at 60c, and dairy products valued at \$3.

Aug. 31. Sold eggs for 90c cash during August.

Aug. 31. Credited Roy Wade with wages for August, \$36.

Aug. 31. The household values the board, room, and laundry of the hired man during August at \$20.

Sept. 1. Paid \$250 to redeem note held by landlord due today.

Sept. 6. Bought bran, shorts, etc., for \$29 cash.

Sept. 6. Sold four calves for \$85 cash.

Sept. 8. Paid Roy Wade on account, \$15.

Sept. 15. Paid for extra help during threshing season, \$4.50.
(Debit Labor.)

Sept. 21. Paid fire insurance premiums, \$8. (Dr. General Expense.)

Sept. 30. The household received during the month, eggs valued at \$1 and dairy products valued at \$5.10.

Sept. 30. Credited Roy Wade with wages for September, \$30.

Sept. 30. The household values the board, room, and laundry of the hired man during September at \$20.

Sept. 30. Paid Roy Wade on account, \$15.

Oct. 6. Paid for winter clothes for self and family, \$86.50.

Oct. 10. Bought for cash, two husking hooks, 40c; two corn knives, 60c; and one wheelbarrow, \$3. (Dr. Equipment.)

Oct. 21. Sold for cash, 30 shotes, 4500 lbs. at \$13 per cwt.

Oct. 31. Credited Roy Wade with wages for October, \$30.

Oct. 31. The household values the board, room, and laundry of the hired man during October at \$20.

Oct. 31. The household received during the month, poultry valued at \$1.25, eggs valued at \$1.20, and dairy products valued at \$6.30.

Nov. 6. One cow valued at \$20 died and was buried on the farm.

Nov. 20. Sold some poultry for \$16.45 cash.

Nov. 30. Donated to the United Charities, \$10. (General Expense.)

Nov. 30. The household received during the month, poultry valued at \$2, eggs valued at \$1.10, and dairy products valued at \$5.90.

Nov. 30. Credited Roy Wade with wages for November, \$30, and paid him \$30 on account.

Nov. 30. The household values the board, room, and laundry of the hired man during the month at \$20.

Dec. 3. Paid cash for bran, shorts, etc., \$26.

Dec. 6. Paid for buggy wheel, \$5.95; one pair trace springs, \$1; one wagon tongue support, \$1.70; one single tree, 60c; nails, screws and bolts, 70c; and two horse blankets, \$5.90. (All are to be charged to Equipment Expense.)

Dec. 15. Paid \$250 to redeem note held by landlord due today.

Dec. 18. Sold some poultry for \$6.20 cash.

Dec. 18. Paid for incidental Christmas purchases, \$10.65.

Dec. 19. Paid Roy Wade on account, \$50.

Dec. 31. The household received during the month, poultry valued at \$1.40, eggs valued at 45c, and dairy products valued at \$4.80.

Dec. 31. Mr. Fay places the value of his services as a laborer at \$600 for the year.

Dec. 31. Inventories taken on this date showed the following values: household furnishings, \$500; horses, \$1100; cattle, \$570; hogs, \$240; bran, shorts, etc., \$15; oats, \$350; corn, \$830; hay,

\$290; poultry, \$25. Equipment has depreciated 10% during the year.

(a) Post all items to the ledger, allowing enough space for the transactions of problem 4 below which require the use of the same ledger accounts.

(b) Take a trial balance before considering inventories.

(c) Make the proper entries for inventories.

(d) Prepare a Loss and Gain account; close and rule off the necessary accounts to show net profit in Fay's Capital account.

(e) Take a trial balance after closing, which may also be used as a Statement of Resources and Liabilities.

(f) Prepare a Farm and Individual Income Statement for the year.

(g) Prepare a Change of Wealth Statement as of Dec. 31, 1916.

Note.—The cash-journal and ledger accounts used in the Fay problem above are to be used in problem 4 below, the latter being a continuation of the affairs of L. E. Fay for the year ended Dec. 31, 1917.

Also, the books and accounts of problem 3 above are to be used later in a comparative study and discussion as outlined under problem 2, Chapters VIII and IX.

4. You are to record in the cash journal (beginning on a new page) the transactions of L. E. Fay for the year ended Dec. 31, 1917, which were as follows:

Jan. 3. Gave two promissory notes to landlord for \$250 each in payment of year's rent, one due Sept. 1 and one Dec. 15, 1917, without interest. (Debit Rent account.)

Jan. 3. Paid Roy Wade cash to balance account.

Jan. 4. Sold some corn for \$400 cash.

Jan. 15. Paid \$20 for clothing.

Jan. 30. Butchered a beef for family use, \$70.

Jan. 31. Took savings bank pass book to bank and had interest credited for the six months to Jan. 1st, \$7.50. (Debit State Trust & Savings Bank and credit Interest.)

Feb. 1. Paid interest on mortgage for six months, \$60.

Feb. 3. Sold beef quarter and other parts of the animal butchered a few days ago for \$30.

Mar. 1. Sold hogs for \$100 cash.

Mar. 1. Paid personal taxes, \$39.

Mar. 20. Paid for sundry household supplies, \$28.

Mar. 31. The household record shows the following commodities turned over to the house during January, February and March: poultry, \$4; eggs, \$9.20; milk, \$22.

Mar. 31. During the three months, the household has sold for cash part of the products as follows: eggs, \$4; butter, \$5.

Apr. 1. Made a contract with Roy Wade similar to the one of last year, except that he begins April 1 instead of May 1, and is to receive \$35 a month and his board, room and laundry, and the use of a horse and buggy.¹

Apr. 1. Sold some hay for \$150 cash.

Apr. 3. Bought millfeed for \$30.

Apr. 18. Paid for harness repairs \$4 (Harness is part of the equipment).

Apr. 28. Paid horseshoeing bill of \$2.

Apr. 30. Credited Roy Wade with wages for April, \$35.

Apr. 30. The household values the board of hired man at \$20 for the month of April.

Note.—On the last day of each month from May to November, both inclusive, you are to make entries for the \$35 wages credited to Roy Wade and for the \$20 board without being told to do so, each time.

May 8. Paid Roy Wade \$5 on account.

May 10. Paid for sundry repairs to equipment, \$8.

June 20. Paid cash for extra labor, \$6.

June 25. Paid Roy Wade \$7 on account.

June 30. The household record shows the following commodities turned over to the house during April, May and June: poultry, \$6; eggs, \$18; milk, \$35.

¹Theoretically, the value placed on the use of the horse and buggy would be debited to Labor and credited to Miscellaneous Income or to General Expense because this concession is equivalent to a recognition that labor is worth more than \$35 plus \$20 board. Mr. Fay, however, does not wish to consider the value of labor as increased by this concession.

June 30. During the three months, the household has sold for cash, part of the products as follows: eggs, \$10; butter, \$15.

July 1. Paid Roy Wade on account, \$10.

July 4. Sundry expenses over the holiday amounted to \$3.10.

July 5. Paid cash for binder twine for 20 acres of wheat and 30 acres of oats, \$25. (Divide the charge between the two accounts on a basis of acreage.)

July 18. Paid for extra labor, \$7.50.

July 20. Paid Roy Wade on account, \$8.

July 21. Bought sundry household supplies for cash, \$11.

July 21. Had interest for 6 months entered in savings bank pass book, \$7.50.

Aug. 1. Sold hay for \$160 cash.

Aug. 1. Withdrew all of savings account balance, and paid interest on mortgage, \$60; and \$500 in reduction of the principal of the mortgage note.

Aug. 1. Paid Roy Wade on account, \$9.

Aug. 8. Paid for new small pieces of equipment, \$12.

Aug. 10. Sold some wheat to D. C. Robbins for \$500, receiving a 60-day note bearing 6% interest.

Aug. 20. Sold some oats for \$450 cash.

Aug. 30. Bought supplies for household, \$15.

Aug. 31. Paid Roy Wade \$8 on account.

Sept. 1. Paid cash for extra labor, \$10.

Sept. 1. Paid \$250 to redeem note held by landlord, due today.

Sept. 8. Sold two calves for \$50 cash.

Sept. 18. Paid Roy Wade \$12 on account.

Sept. 21. Paid fire insurance premiums, \$12.

Sept. 30. The household record shows the following commodities turned over to the house during July, August and September: poultry, \$4; eggs, \$16.30; milk, \$27.

Sept. 30. During the three months, the household has sold for cash part of the products as follows: eggs, \$9; butter, \$12.

Oct. 19. Received a check from D. C. Robbins to redeem his note of August 10, with interest, \$505.

Oct. 19. Paid \$100 for Liberty Bonds. (Dr. Liberty Bond account.)

Oct. 26. Paid Roy Wade \$20 on account.

Oct. 31. Sold some shotes for \$300 cash.

Nov. 6. Bought sundry household supplies, \$15.

Nov. 15. Sold poultry for \$18 cash.

Nov. 16. Donated \$25 to Red Cross work. (General Expense.)

Dec. 1. Sold 400 bu. corn at \$1.20 for cash.

Dec. 2. Bought a half interest¹ in a self feed corn sheller for \$42.50 cash.

Dec. 15. Paid \$250 to redeem note held by landlord due to-day.

Dec. 20. Paid Roy Wade cash to balance his account.

Dec. 20. Paid \$30 cash for household supplies.

Dec. 31. The household record shows the following commodities turned over to the house during October, November and December: poultry, \$10; eggs, \$12; milk, \$30.

Dec. 31. During the three months, the household has sold for cash part of the products as follows: eggs, \$3; butter, \$13.

Dec. 31. Mr. Fay places the value of his services as a laborer at \$600 for the year.

Dec. 31. Inventories taken on this date showed the following values: household furnishings, \$500; horses, \$1200; cattle, \$600; hogs, \$300; poultry, \$30; wheat, \$200; oats, \$300; corn, \$1250; hay, \$330. Equipment has depreciated 10% during the year (diminishing value method).

(a) Post to the ledger accounts.

(b) Take a trial balance before considering inventories.

(c) Make the proper entries for inventories.

(d) Prepare a Loss and Gain account, close and rule off the necessary accounts to show net profit in Fay's Capital account.

(e) Take a trial balance after closing, which may also be used as a Statement of Resources and Liabilities as of Dec. 31, 1917.

(f) Prepare a Farm and Individual Income Statement for the year.

¹ This requires a debit to Equipment account for only \$42.50. If the comparative inventory record were in use, the machine would be entered as a matter of record, with proper notation to indicate the other half-owner.

(g) Prepare a Change of Wealth Statement as of Dec. 31, 1917.

Note.—The books and accounts of problems 3 and 4 above are to be used later in a comparative study and discussion as outlined under problem 2, Chapters VIII and IX.

REVIEW QUESTIONS

1. State two ways of treating expenses and incomes connected with fair exhibits.
2. In shipping goods to be sold on consignment, what entry is made at the time the shipment is sent? Discuss.
3. What entry is made when the consignee renders his account sales?
4. Discuss the use of the Loss on Auction Sales account.
5. What entry is made at the time property is destroyed by fire?
6. When the insurance company settles for a fire loss, what entry is made? When some salvage is sold?
7. How is salvage retained for use on the farm treated in the books? What is done with the balance of Fire Loss account?
8. Discuss two ways of recording death of livestock, stating the effect of each on the livestock account and on the Loss and Gain account.
9. Discuss any special transactions involved in market gardening, and crops sold under contract.
10. What value is considered as the investment in an orchard as compared with expenses of operation?
11. How are incomes and expenses recorded after the orchard begins to bear?
12. When is depreciation figured in an orchard?
13. Why is it not safe to say off-hand that the fruit that sells for the highest price is the one that pays best?
14. Discuss the use of the Woodland account. The Woodland Expense and Income account.
15. After all standing timber is cut and the woodland is cleared for tillage, what entries result?

16. What entries arise in the bee industry?
17. What features in partnership operation of a business require special consideration from a bookkeeping point of view?
18. Discuss the opening entry of a partnership.
19. What is the nature of the entry closing Loss and Gain account in a partnership?
20. Under what conditions may profits or losses be shared equally while the capital of the partners is unequal?
21. What conditions in a partnership make it desirable to credit interest to the proprietors on their capital invested?
22. What is the function of the partner's drawing account?
23. Name the points to be covered in a partnership agreement.
24. How are the resources of a partnership divided at time of dissolution?
25. What is the nature of the entry made at the time of partnership dissolution?
26. Is renting a farm on shares equivalent to forming a partnership?
27. What conditions in leases and methods of accounting are to be considered before determining how to treat transactions relative to share rental?
28. A given tenant receives one-half of value of products and livestock sold. How does his Swine account differ in operation and amounts involved from the account as it would appear if he were a cash renter, or a landlord?
29. What effect does share rental have on the inventory record?
30. How does renting on a cash basis affect the accounts of the tenant?
31. When a landlord owns and operates more than one farm, how should his accounts be kept?
32. What is the purpose of the Change of Wealth statement? Describe its contents and discuss its results.
33. Discuss the Farm and Individual Income Statement when the Household account shows a loss; when it shows a gain; when the Household gain is more than the gain as an individual.

CHAPTER VIII

COST ACCOUNTING

Definition.—It has been said that all accounting is cost accounting. It might better be said that all accounting should be cost accounting. Since there is so much accounting, in the broad sense, however, that records only cash transactions, inventories, deferred charges, and depreciations without attempting to distribute expenses properly over the various productive elements, it is still quite proper to consider that there are two terms in proper use, “accounting,” and “cost accounting.”

A cost system is a method of apportioning elements of expense and income over a number of operations within the same business. Cost accounting is that interpretation of transactions and operations of a business which aims to carry out the purpose of the cost system. Cost accounting results in showing the proper expenses, income, and net gain or loss of each element or department of the business that is maintained for the purpose of producing income.

For the purpose of a cost system, the term “expense” must include something more than an outlay of cash for some commodity or service to be consumed within a short space of time. That is, it must include other than so-called cash expenses.

By the term “operation” in farm cost accounting is meant each of the several crops or classes of livestock which are grown or maintained on the farm. The “productive elements” on a farm include practically the same articles or bodies as the operations, except that draft animals are

not considered as productive elements. The latter are not kept for the purpose of making a profit, but merely to assist in reducing costs of production among the really productive elements.

Cost and General Accounting Compared.—A comparison between a set of accounts kept under a cost system and one kept under a general system might be summarized as follows:

(a) The cost system includes all that the general system does.

(b) The cost system includes no more transactions with outside parties than the general system.

(c) The cost system includes more expenses and incomes within the business, commonly called adjustments, or transfers from one account to another.

The general system, therefore, is sufficient if one wishes to find his profit as a farmer, as distinct from his profit as an individual; and to find the amounts of the expenses and of the sales of various commodities represented by transactions with outsiders. *The general system of accounting is not sufficient if one wishes to find the profit from each branch of his farming operations, after considering all expenses of production and maintenance and all incomes resulting from the consumption of the productive elements on the farm, as well as from sales.*

The showing of such detailed profits requires the keeping of cost records to collect the data. The matter of collecting the data is a very important one in accounting.

Under the general system, data collection is carried on more or less automatically. Some commodities are bought and a bill is received showing the nature and value. This bill is used as a basis for making the check or currency payment and the cash entry. A lease is signed. This forms the basis for making a check or note and the corresponding entries for rent. A contract is made with the hired man.

This is the information supporting the entries for labor. Some grain is sold for cash. The specific amount received supplies the data from which cash is debited and the proper grain account credited.

Under the cost system, data collection includes all that is included under the general system and more. The collection of data for cost records is not carried on automatically, because there are usually no documents to support the making of entries. The nature of the cost data explains this. Cost data are collected from transactions between inanimate objects or inhuman beings on the farm. They represent more or less continuous operations which are difficult to analyze into completed transactions. Hence, it is more difficult to obtain this class of information for bookkeeping entries.

Some of the more important elements of cost not considered for each branch of farm operations in the general system are: labor, horse labor, feed, depreciation of equipment and buildings, repairs, rent, interest and general expenses. Likewise, in general accounting, crops used on the farm are not accounted for as incomes for which the crops should receive credit.

In general accounting, one element similar to these has been considered; namely, the consumption by the household of some of the dairy and poultry products, and the giving by the household of certain services and food for the benefit of farm labor. This is one reason why the transactions between the household and the farm are more involved in cost than in general accounting—because they involve transactions within the farm premises only. They involve, however, transactions between the farm proper and the household, which must be recorded properly in order to enable the profit or loss as a farmer to be shown separate from the profit or loss as an individual even under the general system.

Use of Cost Data.—What is done with the cost data after collection? It is used to the best advantage in the accounts. *All data should be collected with a definite end in view. They should not be collected merely to bring a lot of figures together.*

The results obtained from the collection of a mass of data should be correlated as much as possible with some other results. For example, the results showing the cost of man labor and horse labor in the production of corn should be correlated—brought into juxtaposition—with figures showing other costs connected with corn; and also with income from corn. This is effected by bringing all the information concerning the costs of corn under the account with corn in the ledger. Any information, then, concerning the cost of, or income from, corn can be found by referring to the ledger account bearing that title. It is sometimes necessary to refer back to the account with the field¹ in which it was produced, as field No. 1, No. 2 or No. 3, in order to get certain details of the cost.

In order to get the figures from the cost records into the proper places in the ledger, an entry is made in the cash journal expressing the proper debits and credits to the accounts affected. These are then posted to the proper accounts. For example, if the cost records show that corn valued at \$100 has been fed to the hogs during a given period of time, an entry should be made in the cash journal debiting the Swine account and crediting Corn account. This entry is then posted to the ledger according to the ordinary methods of posting. Such an entry in the cash journal may be dispensed with, if the cost data are tabulated in permanent books that can be used as posting mediums.

This is one of the most essential features of the double entry system of farm accounting. There is a centraliza-

¹ See "Operation of Field Accounts."

tion of data in the accounts which makes the records much more useful than under the single entry or purely statistical system. All figures concerning a department of farm operations are brought together under one heading in the ledger where the net results of the operations of that department can be found. Then the results of these several departmental or productive accounts are brought together under one heading called Loss and Gain account, if they show either an expense or an income. The result of all these losses and gains brought into the Loss and Gain account shows the net loss or gain for the period of time under consideration.

Some so-called systems of farm accounting provide elaborately ruled columns for various and multitudinous figures concerning costs of production, and income and other facts, but they do not make provision for correlating these results with other elements of cost and income. In other words, the many variations of the single entry or statistical system provide for the collection of data without making provision, at the same time, for the intelligent use of such data.

Purpose of a Cost System.—The question should naturally arise, “Why do we keep cost records, including those that show the cost of labor employed, and the cost of grain consumed?”

There are three main reasons for keeping cost records and using the results in the ledger accounts as previously indicated.

(a) *To find the profit from each productive element of the farm after considering all elements of cost.*

(b) *To present figures as a basis for constructive criticism of the business, or of farming methods in use.*

(c) *Theoretically, to fix prices.*

Finding Profit of Each Productive Element.—Analyzing

(a) above, brings out a well established principle in ac-

counting, that a profit is not a profit unless it is produced or calculated after all elements of cost and income have been considered. One cannot truly say that he has made a profit of \$1000 on corn unless he has considered all elements of cost incurred in raising the crop, and all elements of income derived from its disposal. Labor of man and horse is a cost of raising the corn. Contributions by the corn to the upkeep of animals is a benefit derived from the corn and should, therefore, be considered as income from the corn. Corn account should be credited, in other words, with the amount fed to livestock. The same principles apply to other crops.

Likewise, the several classes of livestock should be charged with the value of crops consumed, before finding the profit on them. In short, *expenses in connection with any branch of farming operations should include not only cash expenditures, but all other costs arising from benefits transferred from one department of the farm to another.*

Basis of Constructive Criticism.—Analyzing (b) above, the second reason for keeping cost records, there is one point which stands out preëminent in the operation of a cost system. It affords a basis for intelligent constructive criticism. It forms the basis for judging the relative financial advantages derived from the conduct of the several farming operations. A man usually engages in business for the purpose of making a profit from it. The business of farming is not considered as an exception to this rule.

The farmer desires to make as much money as he can from the time he puts in and the investment he has made. A desire to make money is usually not sufficient. The desire must be backed up by action. The action should be directed along proper channels. The proper channels can be determined very largely by an intelligent perusal and interpretation of the accounts properly kept with the aid of cost records. That is, the intelligent scrutiny of and

interpretation of the Loss and Gain account and the Statement of Resources and Liabilities prepared from books kept under a cost system, will enable a farmer to find out what elements of his farming operations were profitable in a given year and which unprofitable.

By comparing with preceding years, he will be able to form conclusions as to whether the loss or very small profit in any line is due to unfavorable weather or to some apparently more permanent cause, as soil, climate, market conditions or poor management.

Fixing Prices, Theoretically.—The third purpose of cost accounting on a farm, that of fixing prices, is more theoretical than practical. It is theoretical, because cost accounting is not universally applied to farming operations. A few individuals knowing that they are losing money on a certain crop or livestock at prevailing prices cannot prevent the great mass of other farmers from selling below cost. Some farmers like some manufacturers think they are selling everything above cost because they come out ahead financially at the close of the year. As a matter of fact they are sometimes making one remunerative class of goods carry the burdens of another unremunerative class.

If farmers throughout a competing district kept accurate and detailed cost records and accounts they would be able to sell above cost, for the crops that were losing money would be so generally discontinued that prices would be adjusted to a reasonable profit-making figure. As a matter of fact, then, fixing prices of farm products on a basis of cost of production is quite remote, partly because of the great competing area that produces and sells in ignorance of cost, and partly because the competing area includes practically the whole world.

General Scheme of Operation.—*In operating a cost system on the farm, it is necessary to keep the cash journal*

or other suitable books of original entry, and the ledger, the same as in general accounting. In addition to these it is necessary to keep books of record into which to collect data concerning the transactions between the different farm elements. It is not practical to make an entry in the general books (cash journal and ledger) for every day's labor chargeable to the wheat crop, for example. Neither is it practical to make an entry at the close of each day crediting Corn and debiting Horses, Swine or Poultry for the value of feed consumed during the day. Instead of making these entries every day, the data that would otherwise go to make up such entries are collected elsewhere, along with similar data from other days. At the close of a year or month, the aggregate of similar data is used as a basis for making an entry in the cash journal. Thus the Wheat, Corn, Horses, Swine and Poultry accounts are affected ultimately by each day's labor or each day's feed to the same extent they would have been, had the entries been made in the cash journal every day. Obviously the work involved is much less when the labor and feed costs can be collected in subsidiary records and the aggregate results used in debiting and crediting the accounts affected.

The subsidiary records that are in most common use on a farm are the Labor Record, Horse Labor Record, and Feed Record. The Tractor Hour Record is becoming useful.

Labor Records.—The Labor record always means the record showing the number of hours and value of labor performed by man, on each element of farm activity.

Monthly Labor Record.—Illustration 41 presents a form which is bound in book form or created as a loose leaf record to show the class of work each farm hand is engaged in each day.

At the close of each day the number of hours spent on each farm element is recorded as in Illustration 41. For

instance, the illustration shows that on Mar. 1, 1917, two hours were spent in work connected with the keeping of cattle, 1 hour on horses, 1 on swine and 6 in work in field No. 1. On March 2, it is noted, among others, that 1 hour was spent for the household. This might have been in chopping wood, churning, making garden, or some similar work connected with the house. On large farms, a separate monthly record may be kept for each laborer. Each one would be similar to that shown in Illustration 41. At

ILLUSTRATION 41

LABOR RECORD FOR MARCH, 1917

Date	Cattle	Horses	Swine	Field No. 1	Field No. 2	Household	Total
1	2	1	1	6			10
2	2	1	1	5		1	10
3							
<hr/>							
etc.							
31							
Total.....	45	24	18	180	30	50	347

the close of the month, the total of each laborer's sheet would be transferred to a monthly summary.

Using either the Labor record of Illustration 41 or the Labor Summary as described above, at the close of the month, the total is found for each farm element. In Illustration 41, for example, 45 hours were spent on Cattle, 24 on Horses and so on. This total number of hours, multiplied by the rate at which labor is charged, is used as a basis for crediting Labor account and charging Cattle, Horses, Swine, Field No. 1, Field No. 2, Household, etc., respectively.

Yearly Labor Record.—If it is not thought necessary to make cash journal entries for this labor at the close of each month, the labor monthly totals can be summarized on a yearly labor sheet as in Illustration 42. The values in this illustration are calculated on a basis of 20 cents

ILLUSTRATION 42

LABOR RECORD FOR YEAR ENDED FEB. 28, 1918

Month	Cattle	Horses	Swine	Field No. 1	Field No. 2	House- hold	Total
1917							
Mar.....	45	24	18	180	30	50	347
Apr.....							
May.....							
etc.							
1918							
Jan.....							
Feb.....							
Total Hours	500	250	400	700	150	850	2,850
Total Value. ¹	\$100	\$50	\$80	\$140	\$30	\$170	\$570

¹ A table is presented in the Appendix to assist in calculating the value of man and horse labor. See Labor and Horse Labor Conversion Table, Illustration 75.

an hour for labor. The entries for March in Illustration 42 are taken from the totals for the month of March in the monthly labor record of Illustration 41.

Debits and Credits in Labor Record.—The entry to transfer the aggregate value of labor used during the year is shown in Illustration 43, using the figures from Illustration 42.

ILLUSTRATION 43

ENTRY FOR LABOR AT CLOSE OF YEAR

(Simple Journal Form Used for Convenience)

Cattle.....	\$100	
Horses.....	50	
Swine.....	80	
Field No. 1.....	140	
Field No. 2.....	30	
Household.....	170	
Labor (Credited with total).....		\$570

The debits and credits may be posted direct from the Labor Record by indicating the ledger pages below the amounts in the record. However, care should be exercised in making sure that the debits and credits posted are of equal amounts.

Daily Labor Record.—Although entirely impractical for any but the largest farms, a daily labor record may be kept. It shows the exact nature of the work performed by a laborer every hour of the day or even every fifteen minutes if desired. If such a form is employed, it is used as a means of collecting data to fill into the monthly labor record of Illustration 41.

A daily Labor Record designed by the U. S. Department of Agriculture is shown in Illustration 44. It is called "Regular Worker's Daily Time Sheet."¹ Provision is made thereon for showing the nature of the work being done at every change in operations during the day. If the man eats breakfast from 6:30 to 7:00 A.M. that fact is recorded. If it rains from 2:45 to 3:45 P.M., causing work to cease, notation to that effect is made in the proper space indicated by the time of the day in question.

¹ This form has recently been altered somewhat in the details, the principles remaining the same.

ILLUSTRATION 44

REGULAR WORKER'S DAILY TIME SHEET

FORM A.

U. S. Department of Agriculture
in cooperation with

C. A. Smith, Oakdale, Mich.

DAY OF WEEK:

Tuesday,

DATE

April 30,

1917.

KIND OF WORK. Include implements used, number of loads, etc.	FIELD.	MAN HOURS.	HORSE.		
			NO.	HOURS.	
SAMPLE SHEET. Refer to Notes on Cover.					
4.30 —					
5.00 — <i>Care of horses. See Note 9.</i>		½			
5.30 —					
6.00 — <i>Feeding cows and milking. See Note 9.</i>		1¼			
6.30 —					
7.00 — <i>Breakfast.</i>		—			
7.30 —					
8.00 —				See Note 3 (b)	
8.30 — <i>Plowing for corn, 7" deep, 16" riding plow. See Note 4.</i>	A	3	3	9	
9.00 —					
9.30 —					
10.00 —					
10.30 —					
11.00 — <i>Disking for corn (John Deere 12 disk). See Note 4.</i>	B	1¼	4	7	
11.30 —					
12.00 —					
12.30 — <i>Dinner.</i>		—			
1.00 —					
1.30 —					
2.00 — <i>Hauling manure—spreader, 3 loads. Working with Ed. Moore, See Note 5.</i>	A	2			
2.30 —					
3.00 —					
3.30 — <i>Rain—Nothing done. See Note 6.</i>		—			
4.00 —					
4.30 — <i>Repairing fence. See Note 8.</i>		1			
5.00 —					
5.30 — <i>Feeding cows and milking.</i>		1			
6.00 — <i>Care of horses.</i>		¼			
6.30 —					
7.00 — <i>Supper.</i>					
7.30 —					
8.00 —					
WORKMAN	Sam Edwards.		TOTAL HOURS	10¼	16
REMARKS			REPORT O. K. C. A. S., Prop.		

This form of Daily Labor Record is also used to record facts about machines in use. For example, if a specific riding plow is in use from 7:00 to 10:00 A.M. such notation is made together with the nature of the operation "Plowing for corn 7 inches deep." The field in which the operation is carried on is shown in a special column as are also the number of horse hours.

Explanatory notes giving directions for the use of the Regular Worker's Daily Time Sheet are presented in Illustration 45. These directions are printed on the inside front cover of each book put out by the U. S. Department of Agriculture. The book contains a great many of the blank forms of which the one of Illustration 44 is a sample with items recorded thereon for illustrative purposes.

ILLUSTRATION 45

DIRECTIONS FOR MAKING OUT REPORT

(Read Carefully)

1. The time sheet should be made out at the close of each day by each regular workman, and signed by him. The proprietor or superintendent should O. K. the report. If for any reason the regular workman can not make out report the proprietor or superintendent should make it out for him.

2. Each operation or kind of work should be reported separately, so as to avoid confusion in classifying the records.

3. (a) To fill out, draw a line completely across the sheet from the time when you begin a kind of work and another line from the time when you stop that particular work, filling in the name of work between the lines, as, for example, suppose you began plowing for corn, field A, at 7.00 o'clock and finished at 10.00. Draw a line across the sheet from the figure 7.00 and another from the figure 10.00; fill in the words "Plowing;" also give the field letter and number of horses used. Continue the time of beginning and ending on the different kinds of work until all the work for the day is reported. In the proper columns put the

field or place where the work was done, the number of man hours, the number of horses working, and the total number of horse hours. The dots indicate quarter hours.

(b) In figuring horse hours, the number of hours worked should be multiplied by the number of horses used; that is, if you use 2 horses 4 hours, it is 8 horse hours.

4. Name implements used when work is reported, and when hauling state number of loads; also weights, if weighings are made.

5. When two or more men are using the same team only one should report the number of horses and horse hours. The other should report helping or "working with" in the use of said team.

6. Make out report for every day, including Sundays. Account for the whole day. State when nothing is done and, if convenient, give reason.

7. When a man does not work at all on a certain day, report should be made out for that day, stating this fact.

8. Avoid combining reports of different kinds of work, as "plowing and harrowing" a field or using such terms as "odd jobs," "chores," "went to town," etc., as it is impossible to properly interpret such items. State exactly what was done, as "plowing," "harrowing," "mending harness," "repairing fences," "cleaning out horse barn," "went to town for groceries or personal business," etc., giving the time each operation required. Also avoid indefinite expressions as "work on roads," "work on fences," etc., but state what the work was, as "grading farm roads," "public road repairs," "repairing fences," "building fences," etc.

9. In reporting livestock, report separately work on each kind of stock unless otherwise directed by proprietor.

Note.—Make two copies at one time by putting carbon sheet (carbon side down) under sheet. Tear out original and allow copy to remain in pad. Study the sample sheet.

Hourly Cost of Labor:—In calculating the total value of labor in Illustration 42, a rate of 20 cents an hour was used because that is the common rate that has been found

to apply on a great many farms. It is a convenient rate to use because of the ease with which calculations can be made from it. If one does not have occasion to doubt its accuracy to a very great extent, it should be used on the average farm. However, if one finds or knows that labor on his farm costs more or less than that amount, he should use the rate that represents the facts.

When one does not know what rate represents the facts, he may find the rate after having determined the total number of hours in the yearly labor record. This is the amount corresponding to the 2850 hours of Illustration 42. The total hours is divided into the total labor cost as shown on the debit side of Labor account. This result gives the cost per hour for all work during the year. This hourly rate is applied to the total hours of each of the farm elements in the same way as the 20-cent rate was applied in Illustration 42.

If the flat rate of 20 cents is used, it usually leaves a balance in Labor account. Such balance is closed into General Expense before closing the latter.

Horse Labor Record.—The principles presented in connection with labor records are applicable practically without change to horse labor records. In recording the number of hours worked each day, the horse is used as a unit rather than the team. If a team works 6 hours on Field No. 1 on Mar. 1, the notation in the horse labor record at the close of the day would show 12 in the proper place under Field No. 1, opposite Mar. 1. This means 12 horse hours. The summary and journal entry are prepared in the same way as shown for labor in Illustrations 41, 42 and 43. Horses are not charged with the value of their work performed for horses.

In the journal entry, Horse account is credited with the value of the horse labor. The cost per horse hour is calculated on a basis of about one-half the cost of a man

hour. If such an arbitrary rate is not used the cost per hour of horse labor is found by dividing the total horse hours worked during the year on all elements into the cost of maintaining the horses. Such cost of maintenance is determined by taking the net loss shown in the Horse account, after considering inventories and deducting extraordinary losses.

If the flat rate of, say, 10 cents is used, and all of the cost of keeping horses is not charged, or if too much is charged out, any balance remaining in Horse account, after considering inventory, constitutes part of the balance carried to Loss and Gain account, along with profits or losses arising from sale or natural increase.

Tractor Hours.—When the tractor is used in the place of horses, a record similar to the horse labor record is kept so as to show the hours worked on each field. At the close of the month or year, an entry is made to bring the proper charges into the ledger accounts affected, tractor account being credited.

Exchange Labor Account.—In order to account properly for all man and horse labor on the farm, it is often necessary to keep an account which will record the value of the work performed for the neighbors and by the neighbors. This account bears the title "Exchange Labor." It should be treated, for all practical purposes, as an account with the neighbors.

We debit our neighbors through exchange labor account when we work for them and credit them when they work for us. This rule applies in all cases, whether the work be done by man or horse; and whether it be in the oat field or for the house. Exchange of work by the women in the house, as at harvest time, for example, would not come under this rule, but any work performed by neighbors, such as sawing wood for the house, would be given consideration in the account called Exchange Labor.

It is obvious from the nature of the account that it would be in balance at the close of any year, if we worked for our neighbors just as many hours with a man and team as they worked for us. If we worked more hours, the account would have a debit balance. If we worked less hours, it would have a credit balance.

Exchange Labor Balance.—This brings up an important feature of this account. Ordinarily, if we charge someone for services and do not get full pay in return, we consider the debit balance in such an account as a resource. In this case it is not a resource, because we do not expect to collect it, under the usual working agreements existing among farmers.

The balance of Exchange Labor account is an expense or an income depending on whether it is a debit or credit respectively. Any balance remaining in the account at the time of closing the books for the year, is closed into General Expense account. *A debit balance of the Exchange Labor account is considered an expense in that it represents a donation to our neighbors. A credit balance is considered as an income or negative expense and is credited to General Expense account because it is an item that tends to reduce the farm expenses.*

The disposition of the balance of the account is the element that gives it its name. It might be called "neighbors" account, except for the fact that the balance of the account with such a title should be considered as a resource or liability. With the title "Exchange Labor," it is apparent that its balance is an expense or income.

The account as described above is seen to be one that shows in the aggregate the relation between the amount of labor given and received in exchange with the neighbors. Its purpose is served at the end of a year if it enables the farmer to form opinions and policies as to the exchange of labor in succeeding years. It does not show

the exchange labor relations with each of the neighbors, but merely with all of them considered together. If one wants to find out whether he is giving more labor than he receives from any specific neighbor, he can keep a memorandum of the number of hours exchanged between himself and the neighbor. Such a notation would not affect the keeping of the Exchange Labor account in any way.

Recording Exchange Labor.—*The Entries in the Exchange Labor account come from the Labor record and the Horse Labor record.* In these two records, all debits and credits to Exchange Labor account have their origin. The debits are expressed in the same way that debits are expressed for work performed on the farm. The credits are expressed from time to time by some distinguishing mark to indicate the specific labor performed by the neighbors.

The operation of these original entries for debits and credits to Exchange Labor is represented in Illustrations 46 and 47.

Illustration 46 represents a labor record for a month in which we worked for neighbors and neighbors worked for us. It shows that on July 1, our neighbors worked 40 hours in field No. 1, while the regularly employed men (proprietor or hired man, or both) worked 16 hours in the same field. On July 2, our neighbors worked 42 hours in field No. 1, while the regular men worked 16 hours in the field. These facts are shown in the column headed Field No. 1. The number of hours worked in that field by all classes of laborers on July 1 was 56 and on July 2 was 58. The 40 and 42 hours worked by the neighbors are recorded in parentheses merely as a means of identification, so that they may be kept separate throughout the month and year. For this reason, the totals, both vertical and horizontal, show within parentheses the hours worked by the neigh-

ILLUSTRATION 46

LABOR RECORD INVOLVING EXCHANGE LABOR FOR JULY, 1917

Date	Cattle	Horses	Swine	Field No. 1	Ex- change Labor	House- hold	Total
1.....	2	1	1	(40) 16 (42) 16		1	(40) 20 (42) 20
2.....	2	1	1				
3.....	3	1	2		12	3	21
<hr/>							
etc.							
30.....	3	2	1		13		19
31.....	2	1	1		14	1	19
Total Hours	60	35	30	(82) 32	39	37	(82) 233

bors.¹ Thus, the total for July 1 shows 40 hours worked by the neighbors and 20 hours by the regular men. Likewise, the total of the Field No. 1 column, shows 82 hours worked by neighbors and 32 hours worked by the regulars during the month. The totals for the month are self-proving, in that the amounts in the lower right-hand corner are obtained by adding the total column or by adding horizontally the totals of the several columns as cattle, horses and so on. In this way it is proved that during the month of July the total hours worked by our neighbors was 82 and by the regular men on the farm, 233.

In order to find the number of hours that we worked for neighbors during the month of July, it is necessary to refer only to the column headed Exchange Labor. It

¹ Instead of parentheses the distinction could be made by means of red ink or red pencil.

ILLUSTRATION 47

LABOR RECORD, INVOLVING EXCHANGE LABOR, FOR THE YEAR
ENDED FEB. 28, 1918

Month	Cattle	Horses	Swine	Field No. 1	Ex- change Labor	House- hold	Total Hours
1917							
March.....	78	43	45	13		8	187
April.....	83	47	52	42	16	20	260
May.....	70	40	43			45	198
June.....	65	40	37	{ (33) 44	12	10	{ (33) 208 }
July.....	60	35	30	{ (82) 32	39	37	{ (82) 233 }
Aug.....	50	38	35		20	27	170
Sept.....	55	28	60			48	191
Oct.....	55	25	46	38	40	58	262
Nov.....	67	36	51		30	63	247
Dec.....	68	50	62			77	257
1918							
Jan.....	72	46	54			86	258
Feb.....	75	45	50			40	210
Total Hours.	798	473	565	(115) 169	157	519	(115) 2,681
Total Value at 20c. per hour.....	\$159.60	\$94.60	\$113.00	(23.00) \$33.80	\$31.40	\$103.80	(23.00) \$536.20

shows that we worked for neighbors 12 hours on July 3, 13 hours on July 30, and 14 hours on July 31. Apparently we did not work for them on any day between July 3

and July 30, for the total of the column seems to be the total of the three figures shown in the illustration. These last named figures for exchange labor are not identified by parentheses because they are sufficiently designated by being placed in a special exchange labor column.

Illustration 47 shows a labor record summary for the year. It is prepared from the twelve monthly labor records of the year. The method of preparing the yearly summary can be studied by verifying the transfer of the July totals, as given in Illustration 46, to the space used for July results in Illustration 47. The figures for the other months in the yearly summary labor record are obtained by a process similar to that used in obtaining the July results.

The labor record for the year has two totals, one for the time worked expressed in hours, and the other for the value of the time expressed in dollars and cents. In Illustration 47 the total value is obtained by considering one hour's time as worth twenty cents, a fair average rate.

The items in parentheses have been carried through to the final total, which shows that \$23 is the value of the time worked by neighbors on the various farm operations during the year. The yearly summary also shows that we worked for neighbors 157 hours, which is charged at a value of \$31.40.

The debits and credits expressed in the Labor Record for the year, as presented in Illustration 47, may be expressed first in the cash journal, as shown in Illustration 48, or may be posted direct to the ledger accounts from the labor record book.

It may be concluded from the entry of Illustration 48 that the object in designating by parenthesis, or any other device, the labor performed by the neighbors from day to day and month to month, is to obtain the amount to credit to Exchange Labor account at the close of the year,

ILLUSTRATION 48

ENTRY INVOLVING EXCHANGE LABOR, FEB. 28, 1918
(SIMPLE JOURNAL FORM USED FOR CONVENIENCE)

Cattle.....	\$159.60	
Horses.....	94.60	
Swine.....	113.00	
Field No. 1.....	56.80	
Exchange Labor.....	31.40	
Household.....	103.80	
Labor.....		\$536.20
Exchange Labor.....		23.00

\$23 in the case at hand. Exchange Labor account is debited with the value of labor chargeable to the neighbors, \$31.40 in this case, as shown by the exchange labor column of Illustration 47.

Concerning the debit to Field No. 1 as expressed in the entry of Illustration 48, it is perhaps sufficient to state that the \$56.80 is the sum of the \$23 and \$33.80, the value of neighbors' time and time of regular men spent on Field No. 1 during the year as shown in the Labor Record of Illustration 47. Field No. 1 is properly charged with all labor performed on it, whether that labor is paid for in cash or in services.

Exchange Labor for Horses.—The same principles and methods presented for recording exchange labor for men apply to exchange labor for horses. One Exchange Labor account is used for recording both man and horse labor exchanged with the neighbors.

The horse exchange labor is recorded in the horse labor monthly record and carried to the yearly horse labor summary in exactly the same way that the man labor is (Illustrations 46 and 47). The same method, the parenthesis, is used for designating the labor performed by neighbors'

horses. A fair average rate for horses is ten cents an hour.

At the close of the year the proper accounts are debited direct from the horse labor summary for the year, or through journal entry, in a way exactly like that in Illustration 48. The debits expressed are taken directly from the totals of the several columns in the horse labor summary for the year. The credits, which should equal the sum of the debits, are taken from the totals in the lower right-hand corner of the summary. The amount of the total in parenthesis is credited to Exchange Labor account and the other total is credited to Horses account.

Feed Record.—The quantities of corn, oats, hay, barley, mill feed or other crops or products fed to livestock are recorded in a feed record in a way similar to the entries in the labor record. It is not considered essential in practical farming to make a notation of the amount fed each day to each class of animals. Tests can be made from time to time to find the average per day. This can be used as a basis for the month.

However, the theory is the same, namely, to show the value of each class of feed consumed by each class of animals so that an entry can be made in the cash journal and ultimately in the ledger accounts before the accounts are closed for the year. The value of all products fed to animals is calculated at the average market price during the month in which they are fed (See Appendix).

It is not possible to make the feed record as condensed as the labor record, unless only monthly entries are made. In that case it is necessary to have two tables, one for the livestock by months and one for the feed by months, as in Illustrations 49 and 50.

In these illustrations, the values only are recorded. The quantities may be recorded in any convenient form in the barns or in the house.

ILLUSTRATION 49

FEED RECORD FOR YEAR ENDED FEB. 28, 1918
SHOWING CHARGES TO ANIMALS

Month	Cattle	Hogs	Horses	Poultry	Sheep	Total
Mar.	\$23.80	\$31.00	\$38.50	\$3.50	\$30.00	\$126.80
Apr.						
May.						
<hr/>						
1918						
Jan.						
Feb.						
Total Value..	\$130.00	\$200.00	\$120.00	\$50.00	\$290.00	\$790.00

Assuming that during the month of March the feed consumed was as indicated below, the entries in the Feed Record would be made as shown for the month of March in Illustrations 49 and 50. By Horses: 25 bu.¹ corn at 58c. (\$14.50); 2,500 lbs. hay at \$16 (\$20); 10 bu. oats at 40c. (\$4). By Cattle: 10 bu. corn at 58c. (\$5.80); 1,500 lbs. hay at \$16 (\$12); 120 pasture days at 5c. (\$6). By Swine: 50 bu. corn at 58c. (\$29); 40 pasture days at 5c. (\$2). By Poultry: 100 lbs. mill feed at \$1.30 (\$1.30); 2 bu. wheat at \$1.10 (\$2.20). By Sheep: 600 pasture days at 5c. (\$30).

Using the figures given above, the item \$23.80 under Cattle for March in Illustration 49 is obtained as follows:

Corn.....	\$5.80
Hay.....	12.00
Pasture.....	6.00
<hr/>	
Total for March.....	\$23.80
<hr/>	

¹ See Feed Conversion Table in the Appendix, Illustration 76.

ILLUSTRATION 50

FEED RECORD FOR YEAR ENDED FEB. 28, 1918
SHOWING CREDITS TO CROPS OR FEED

Month	Corn	Oats	Wheat	Hay	Mill- Feed	Pas- ture	Total
Mar. . .	\$49.30	\$4.00	\$2.20	\$32.00	\$1.30	\$38.00	\$126.80
Apr. . .							
May . . .							
<hr/>							
1918							
Jan. . .							
Feb. . .							
Total							
Value	\$200.00	\$100.00	\$40.00	\$200.00	\$50.00	\$200.00	\$790.00

Similarly from the data presented above, the item \$49.30 under Corn for March in Illustration 50 is obtained as follows:

By Horses	\$14.50
By Cattle	5.80
By Swine	29.00
<hr/>	
Total for March	\$49.30
<hr/>	

Debits and Credits in Feed Record.—It should be observed that the total amount charged to animals for feed should always be the same as the total credited to crops. In Illustrations 49 and 50 the total of each is \$790.

The entry to record the values on the books as given in Illustrations 49 and 50, is in the form shown in Illustration 51.

ILLUSTRATION 51

JOURNAL ENTRY MADE FROM FEED RECORDS FEB. 28, 1918

Cattle.....	\$130.00	
Hogs.....	200.00	
Horses.....	120.00	
Poultry.....	50.00	
Sheep.....	290.00	
	<i>790.00</i>	
Corn.....		\$200.00
Oats.....		100.00
Wheat.....		40.00
Hay.....		200.00
Mill Feed.....		50.00
Pasture.....		200.00
		<i>790.00</i>

It is noticed that the journal entry is in balance as it should be, that is, the sum of the debits is equal to the sum of the credits.

Totals may be posted direct from the feed record without making journal entries first if the feed record is made in permanent book form. If the direct posting method is followed, care should always be exercised in balancing the two records. That is, one should make sure that the sum of all charges to livestock accounts is equal to the sum of all credits to the feed and crop accounts.

See Illustrative Problems for Chapters VIII and IX, at the close of Chapter IX.

REVIEW QUESTIONS

1. What is meant by a cost system?
2. What is cost accounting?
3. State three fundamental points of comparison or difference between cost and general accounting.

4. Under what conditions is the general system of accounting inadequate?
5. Why are cost records kept?
6. Discuss the collection of cost data as to
 - (a) Source and nature of information,
 - (b) Method of recording or tabulating.
7. What is done with the cost data after collection?
8. Name and discuss briefly three purposes of a cost system.
9. Describe the construction and use of the monthly labor record, the yearly labor record.
10. To what extent may it be said that the yearly labor record expresses debits and credits?
11. Discuss the practical use of a daily labor record.
12. If a flat hourly labor rate is not used, how may the cost of labor per hour be calculated in any case?
13. Describe the monthly and yearly horse labor record, presenting points of similarity or difference as compared with the labor record.
14. How may a tractor receive proper credit for its work on the farm?
15. What is the purpose of the Exchange Labor account? When is it debited? When credited?
16. Under what conditions does the Exchange Labor account have a debit balance? A credit balance?
17. What does a debit balance in the Exchange Labor account mean? A credit balance?
18. Describe a means of recording in the labor record exchange labor for the neighbors and by the neighbors.
19. Why is it proper to charge a crop with the value of labor performed on it by neighbors?
20. Compare the treatment of horse exchange labor with man exchange labor.
21. What is the purpose of the feed record?
22. Describe a form of feed record. What debits and credits are expressed therein?

CHAPTER IX

COST ACCOUNTING (CONTINUED)

The Farm Plot.—A plot of the farm is a convenient and useful record to have on a farm. It is especially desirable for use in connection with a cost system. It is not a part of the accounting system proper, but may be sketched in the back part of the ledger or cash journal.

The plot may be elaborate, or it may be merely an outline sketch drawn roughly to some convenient scale, showing the general dimensions, size and shape of the various fields, cultivated or uncultivated. Each field should bear a number to remain unchanged as long as possible. If it is necessary to divide field No. 4, for example, into two parts, they should be designated as 4a and 4b.

From the viewpoint of farm management, the plot may be used for a number of purposes. From an accounting viewpoint, its chief advantage lies in the fact that it always presents a ready reference for sizes, numbers and locations of fields. If the plot is used for recording rotations of crops, and other data of similar importance, it may serve as a means of comparing unit costs of production under various methods of farming.

Field Accounts—General.—As mentioned in the discussion of Farm Crops in Chapter VI, detailed costs of production are not kept in the crop accounts, but in accounts with the various fields in which the crops are raised. There are three principal reasons for keeping separate accounts with the fields and crops.

1. To afford a convenient and accurate means of ac-

counting for fertilizer unused, and for fall plowing and other work performed on a field when such work is not applicable to any crop of the current year.

2. To enable one to find the unit cost of production on different fields, as a means of testing the relative merits of different crop rotations, fertilizers, methods of cultivation or other theories of management.

3. To permit the complete separation of one year's crop from the next, when it happens, as is often the case, that one year's crop is not all disposed of before the next one is harvested.

Field Accounts—Contents.—Separate accounts are kept with each field, designated by number as indicated by the farm plot. *A field account is charged at the beginning of a fiscal year with the value of fertilizer unexhausted in the field, with the value of any seed sown but not yet harvested, and for the value of labor, horse labor, use of equipment or other charge for services or expenses incurred on the crop in the ground at that time.* The items enumerated constitute what is known as the field inventory or deferred charges carried down from the preceding period.

During the year the appropriate field account is charged with all expenses for seed, fertilizer, labor, horse labor, equipment use, general expenses, rent, interest on investment and other charges incurred during the period.

The appropriate field account is credited at the close of the year with the inventory value of seed, labor, fertilizer and other items debited to the account during the current year, but which are applicable to the crop of the succeeding year or years. Any balance remaining is transferred to the appropriate crop or feed account by crediting the field and debiting the crop account. This entry closes the field account for the year. The inventory of charges to be carried to the operations of the succeeding year is then brought down as a debit balance in the field account.

The charges for labor, horse labor and other items mentioned above should include all costs up to the time the crop is ready to be removed from the field. In the case of small grain and hay or forage crops, it includes the cost of cutting, shocking or cocking. In the case of corn, it includes all costs up to the time the crop is ready to cut for fodder or silage; or to husk.

This distinction is made between production costs and harvesting costs, so that production costs will afford a more uniform basis for comparison of one year with another, thus enabling crops used for several different purposes to be charged properly. For example, at the time of harvesting oats in one year, all oats may be stored on the premises. In another year a large part of them may be hauled from the threshing machine to market. If the field account is charged with the cost of harvesting, it would be charged with more the second year than the first, unless the difficult task were undertaken of separating the charge for hauling to market from the other threshing costs.

In the case of oats and similar grains, the Oats account is charged with the total cost transferred from the field. This cost includes something for straw. The straw should then be separated from the oats by debiting Straw and crediting Oats account with a fair market value for straw. Straw account is then considered as more of an inventory account from which no profit is ordinarily expected.

Operation of Field Accounts.—Under the principles governing the contents of field accounts as presented above, the question sometimes arises as to just when and how the entries should be made. This is especially true in the case of a field from which the crop is harvested about the middle of the fiscal year, and it is desired to transfer the balance of the field account to a crop account, in order to show the cost of the crop before it is fed or sold.

It might be said here, that the crop is fed or sold at

market price; hence the sale can be made and entered without knowing what the cost of producing the crop was until the close of the year. The same is true of the feed summary, although in this case the results would usually not be credited to the crop account until the close of the year anyway.

As an example of the way a field account is operated in connection with the crop account, Illustration 52 presents a typical field account, figures having been taken from an Illinois farm on which corn is produced. It also presents the Corn account affected by the product of the field.

From a careful analysis of Field No. 5 and Corn accounts presented in Illustration 52 the use of the two accounts may be compared.

Field No. 5 account is charged with the value of seed at the time of planting and with fertilizer at time of application. All other charges are made at the close of the fiscal year, Feb. 28, 1918. The labor and horse labor charges come from the yearly labor summaries, while the interest and equipment expense are calculated at the close of the year and constitute part of the closing entry at that time. At the time of harvest, or on the last day of the month in which the harvest was completed, theoretically, an entry should be made crediting the Field No. 5 account and debiting Corn account with the cost of production. As a matter of fact the complete entry is not made at that time because the cost cannot be determined until the charges referred to above are made at the close of the year. Accordingly, at the time of harvest, the Field account is credited and Corn account debited, in the explanation columns only, with the number of bushels harvested.

When the total costs and the labor and fertilizer inventories are recorded, the cost of production is calculated as being the amount required to balance the field account. This amount, \$285.56, in Illustration 52, is placed in the

credit money column of Field No. 5 account and debit money column of Corn account on the line which previously showed only the number of bushels transferred from the Field to the Crop account. At that time the cost of production per bushel is calculated and recorded in the Field account in the same way that the 25.7 cents is shown in Illustration 52. This cost does not include the cost of husking, as that is charged to the Corn account. The 25.7 cents represents the cost, on a basis of which one might sell his crop in the field.

Operation of Crop Accounts.—*The Corn account presented in Illustration 52, typical of all crop accounts, is charged with the value of corn on the farm at the beginning of the fiscal year. It is charged at the time of harvest with the number of bushels from each field, the figures being placed in the explanation column. The other charges are posted to the account at the close of the year, at which time also the value of the corn harvested from the several fields is recorded in the money column on the debit side of Corn account, as explained above in the discussion of Field No. 5 account. The value of corn fed to livestock is credited to Corn account at the close of the year from the yearly feed summary or from the journal entry prepared from the summary. Any sales on the market are credited at the time of sale or at least are recorded in the cash journal as credits to Corn account. They may be posted at the close of the year. The inventory entry for corn on hand is made, and any balance remaining in the account thereafter is transferred to Loss and Gain account at the close of the year.*

In the Corn account shown in Illustration 52, it may be seen that three fields contributed to the supply of corn.

The labor and horse labor charged to the Corn account represent the charge for husking. These charges, together with other costs shown in the account except the inventory

ILLUSTRATION 52

FIELD AND CROP ACCOUNTS

Field No. 5

1917		1917	
Apr. 1 Fertilizer.....	\$36.00	Nov. 30 1109 1/2 bu. to	
May 1 Seed.....	5.10	corn a/c at	
1918		25.7 cents..	\$285.56
Feb. 28 Labor for year	\$51.90.	1918	
Feb. 28 Horse Labor		Feb. 28 Labor Invty..	\$14.00
for year.....	65.86	Feb. 28 Horse Labor	
Feb. 28 Int. on Invest.		Invty.....	17.30
for year.....	175.00	Feb. 28 Fertilizer In-	
Feb. 28 Equip't Exp..	10.00	ventory.....	27.00
	<u>\$343.86</u>		<u>\$343.86</u>
1918			
Mar. 1 Labor Invty..	\$14.00		
Mar. 1 Horse Labor			
Invty.....	17.30		
Mar. 1 Fertilizer In-			
ventory.....	27.00		

at the beginning of the year, make a total charge of \$640.06, which might be considered as the cost of making this year's crop available for sale or for feeding from the crib. This amount divided by the 1948.5 bushels harvested results in a per bushel cost of 32.8 cents, to be used as a basis for figuring profit per bushel if sold or fed from the crib. If sold at the elevator the 32.8 cents would be increased by the per bushel cost of hauling. The hauling cost is regularly charged to Corn account through the labor and horse labor records.

ILLUSTRATION 52—*Continued**Corn Account*

1917	1918
Feb. 28 Bal. on hand.. \$656.00	Feb. 28 Fed during yr.
Nov. 30 From field No. 5	per feed sum-
(1109½ Bu.) 285.56	mary.....\$1,473.48
Nov. 30 From field No. 6	Feb. 28 Inventory.... 510.00
(752 Bu.).... 223.45	
Nov. 30 From field No. 8	
(87 bu.)..... 32.20	
1918	
Feb. 28 Labor for year 38.92	
Feb. 28 Horse labor for	
year..... 33.66	
Feb. 28 Equip't Exp.. 4.50	
Feb. 28 Bldg. Expense 13.77	
Feb. 28 General Ex-	
pense propor-	
tion..... 8.00	
Feb. 28 To Loss & Gain	
(net gain for	
year)..... 687.42	
<u>\$1,983.48</u>	<u>\$1,983.48</u>
1918	
Mar. 1 Inventory.... \$510.00	

Silage Account.—When corn is harvested and used for silage, it is necessary to make entries to show, among others, the following facts:

1. That the Field account is credited with the cost of producing the corn used in silage.

2. That Corn account is credited with the market value of the corn used in silage.

3. That Silage account is charged with the market value of the corn used.

In order to show these facts on the books, it is necessary to consider the corn used in the silo as passing through the corn crib and being sold out to the silo, although, as a matter of fact, the corn does not take such a route to the silo. This gives rise to the following series of entries, then, in charging the Silage account with the material used.

(a) Debit Corn account and credit the proper Field account with the cost of producing all corn in the field as described under "Operation of Field Accounts."

(b) Debit Silage account and credit Corn account at September market price with the quantity of corn used in silage. This quantity can be estimated quite accurately from the number of rows or area of corn used and the average number of bushels per acre in that field, if any is husked.

These two entries (a) and (b) leave the Field account in just the condition it would have been, had all the corn been husked. It leaves the Corn account showing just the same profit it would have shown, had all the corn been fed or sold. This is the correct way to leave the Corn account, for the corn used for silage should affect the corn in the same way as does corn used for feed in any other form. The only difference is that in the case of silage, the corn is not husked nor placed in a crib. Nevertheless it should receive full credit, as a crop, for all the corn raised on the premises, regardless of its ultimate use. Also, the entries named above provide for charging the Silage account with the proper amount for the corn that enters into it.

After making entries (a) and (b) as described above, the Silage account stands debited with the value of the corn at September market price. The account should be charged also with the cost of filling the silo from the time the corn is taken from the field. The cost of cutting the

corn should be charged to Corn account in the same way that cost of husking would be charged. These entries are made in the regular way after the time has been recorded in the man and horse labor records.

These two elements, then,—cost of the corn and cost of filling—constitute the direct cost of silage. To these must be added at the close of the year, through proper entries, any charges arising from depreciation of silo, silage cutter, rent, or interest on investment in silo, and a proportion of equipment and general expense. The sum of these charges is the cost of silage. The cost per ton should be calculated in order to have the latter figure to use as a basis for charging the silage to livestock.

The Silage account is credited through the feed record with the value of silage fed to livestock. After the number of tons fed has been determined in the feed record, the value is found by multiplying the number of tons fed by the cost per ton as determined from the debit side of Silage account. Theoretically, when all silage has been fed, the account should be in balance. Practically, there will usually be a slight balance due to shrinkage, or to error in estimating the tons produced or fed. Any balance remaining in the account when no silage is on hand should be charged to General Expense. At the close of the year, any silage on hand is carried down as an inventory. If it is apparent that the quantity expressed by the book value at the close of the year does not correspond with the quantity in the silo, an adjustment should be made between Silage and General Expense account in such a way as to bring the Silage account into harmony with the physical valuation of the silage.

Fodder.—The cost of corn fodder is determined and entered in the same way as described for silage, being carried through Corn account and charged to fodder at market price of September corn. It is credited at the cost price

of the fodder for the quantities shown in the feed record.

Seed Account.—One Seed account may be made to serve for recording values of all classes of seed. The account is used to show the value of seed on hand at any time, especially at the close of the year.

It is charged with the fair market value of seed at the time it is sorted from the regular crop, no matter whether it is corn, oats, wheat, clover or other product. The proper crop account is credited at that time. Seed account is credited for the book value of seed used, the Field account being charged. That is, if seed corn has been charged to the Seed account at \$3 a bushel at the time of selecting seed, the Seed account is credited and the proper Field account debited with \$3 a bushel at the time of planting.

If seed unused for the purpose intended is fed to live-stock, the Seed account is credited and the appropriate livestock account debited with the market price of the product as feed and not as seed. This would naturally leave a debit balance in Seed account after all the seed has been used. Any balance remaining in the account may be closed into General Expense whether the balance be a debit or a credit.

The Household and Farm Products.—It has been stated elsewhere that the Household should be charged with the farm value¹ of farm products used. As a matter of practical application this statement might be modified to read "the household should be charged with all milk and eggs produced on the farm and with all garden expenses, and with such other farm products as are used in the house."

The exceptions made in the case of milk, eggs and garden are explained best by a slight analysis of conditions. In general they are made in order to reduce the detail required in keeping track of small quantities used by the household.

¹ Farm value means market price minus cost of marketing.

Milk.—The Household should be charged and Cattle credited with the value of all milk produced, provided the production of milk is merely incidental to the main objects in farming. If any substantial amount of milk or cream is sold, the statement above would not apply.

When all milk is charged to the Household, it follows that the Household should be credited for any milk, cream or butter subsequently sold. Also, the Household is credited, and the Poultry, Swine or Cattle charged with any skim-milk or butter-milk fed to the chickens, pigs or calves. The entries for the production of milk and for the milk products fed to livestock, are made only once a month. In the meantime, memoranda are made to show quantities produced or fed.

Eggs.—At the time of gathering eggs, a memorandum should be made showing the number of eggs. At the close of the month a fair average market value is placed on the eggs and an entry made charging Household and crediting Poultry with all the eggs gathered during the month. If any eggs are sold from the premises, the Household is credited, and Cash (presumably) debited.

This treatment places the burden for the details concerning eggs upon the household. It can very often be assigned to a young member of the family, thus relieving farm accounting of some of its details.

As in the case of milk, this method of accounting for eggs applies to the general farm, and not to the poultry ranch.

Garden.—Under a cost system, considerable detail can be avoided in connection with the garden products used, if all expenses in connection with the garden are charged to the Household, and all incomes from sale of garden truck are credited to the Household. With this arrangement it would not be necessary to keep a record of, nor make entries for the garden truck used by the house.

The Household is charged with the cost of plowing, plant-

ing, cultivating, etc., and with any other work performed by horses in the garden or by anyone from the household whose time might ordinarily be charged to Labor account. It is also charged with a proportion of rent or interest on investment, with equipment expense and any general expense that might be pro rated over the area occupied by the garden. No entry is required when garden products are used in the house; but the household is credited when any products are sold to outside parties.

It is sometimes better to keep a separate account with the garden. In such cases the Garden account is charged with all the elements of cost enumerated in the preceding paragraph. It is credited with any products sold to outsiders, but not with products consumed by the household. At the close of the year any balance is closed into the Household account. Thus, the ultimate result is exactly the same whether the charges and credits are carried through the Garden account or made in the Household account direct.

For the purpose of treating a garden in this way, the term should be limited to include only the plot of ground near the house, designed primarily to provide for the needs of the household. Any special plots of potatoes, sweet corn, melons, or other products ordinarily found in a garden, but meant in any particular case primarily for sale on the market, should be treated in the same way as a field producing farm crops.

Pasture.—Following the general principles of cost accounting of charging all expenses and crediting all incomes to the accounts directly affected, it is necessary to treat pastures in somewhat the same way that any other field is treated. However, a pasture has some characteristics of a crop, and some of a field. Accordingly, it is permissible to have the Pasture account show a loss or gain, while it is not proper for a field account to show a loss or gain.

The Pasture account is charged with any deferred debits carried down from the preceding year, such as cost of seedling, also with rent or interest on investment and any other direct or indirect costs that might be pro rated to it at the close of the year. The account is credited with the feed obtained from it by the livestock. The value of the feed is determined by considering the average amount that an animal can consume in one day. Five cents a day for an animal is considered a fair market value for pasture. The term pasture-day is used in this connection. It means the grazing by one animal for one day. If there are twenty cattle in a pasture for each day of a standard month, there would be 600 (20×30) pasture days for which to make an entry. Considering a pasture-day as valued at five cents,¹ there would be expressed a debit to Cattle and a credit to Pasture of \$30 for the use of the pasture for the month.

By-Products.—An account called “By-Products” is used for the purpose of recording the value of crop residues consumed in the field by livestock after the crop has been harvested. This condition arises when livestock is turned into oats or wheat stubble or into corn stalks after husking. The livestock, obviously, should be charged for the feed they obtain in this way, since it takes the place of regular pasture or other feed. The question arises as to what account to credit. The account with “By-Products” is the one which shows most clearly what the nature of the income is. It cannot be called an income from the crop for the crop cannot be considered as contributing something which it never had. If the crop account is not charged with the value of the stubble or corn stalks it should not be credited when the latter are used to the advantage of the farm. An exception to the use of this

¹ During the year since war conditions affected prices so extensively, the value of pasture rental is nearly double the figure quoted above.

account is found in the case of a second growth of hay pastured.

The field account should not be credited, for it is merely an intermediate account for the purpose of accumulating costs of production to transfer to the crop accounts, and for taking care of deferred charges for labor, fertilizer and so on. It is not the nature of the field that caused the livestock to be turned into it. It is the managing ability of the farmer. As such, his ability to take advantage of by-products of the fields should be recorded in a separate account where its results may be seen in the aggregate, at the close of each year. The balance of the By-products account is closed into Loss and Gain account at the close of the year.

The value of the feed obtained by livestock in stubble fields or corn stalks is determined in the same way as the value of ordinary pasture feed.

Rent Distribution.—When farm rent is considered as an element increasing the cost of production, it is essential that the total rent should be distributed over the farm elements on a reasonable basis. The time and method of distributing rent are the two important factors that need special consideration.

As for the time of making the entry, it may be said that the best time is at the beginning of the year when the lease becomes effective.

The method of distributing the rent depends upon the nature of the lease, whether it is on (a) a cash or (b) share rent basis.

(a) *Under the cash rent basis, it is definitely known what the total rent is. The rent per acre of tillable and pasture land can be calculated, also the rent of the buildings and barnyard. After the total for each field, and for the buildings, has been determined, an entry is made crediting Notes Payable and charging the several field ac-*

counts, Pasture, Swine, Poultry, Cattle, Horses, Corn and Household, each with its pro rata share of rent. Each class of livestock is charged with the estimated rent of the building or buildings it uses. The household is charged with the rent of house and garden. Corn or other crop account is charged with the pro rated amount for use of cribs, granaries, etc., used for storage purposes. Equipment Expense account may be charged with an amount to represent the use of machine sheds.

The entry suggested above indicated a credit to Notes Payable. This assumes that notes are given for the amount of the rent at the time of signing the lease. If no notes are given, the landlord's account is credited instead of Notes Payable. When notes for rent are given before the beginning of the year to which they apply, Notes Payable is credited and "19— Rent" account debited. The latter account is then considered as a deferred resource until the beginning of the fiscal year to which it applies. At the beginning of the year, under the last named conditions, the "19— Rent" account is credited and the several fields, livestock and other accounts charged as described in the preceding paragraph.

The "19— Rent" account is made to fit the year of the operations to which it applies. For example, when a lease is signed and notes given in November, 1916, for the fiscal year beginning March 1, 1917, the amount of the rent is charged to "1917 Rent" account.

(b) *Under the share rent basis it is not definitely known what the total rent is for the year.* Accordingly, it presents a very complex situation unless one resorts to estimates and makes entries similar to those explained for cash rent, above.

The following procedure is suggested as the most practical under the ordinary share rent agreement:

At the beginning of the year to which the lease applies,

an entry is made crediting Rent Adjustment account and debiting the fields, livestock, household and other accounts in the same manner as for cash rent. The amount to charge to each is determined according to a fair cash rental basis for the same farm.

As crops or livestock are disposed of the appropriate crop or livestock account is credited for the total sale, the Rent Adjustment account being debited with the landlord's share (if he takes the cash direct from the sale or if it is deposited in the bank to his credit), and cash being debited for the tenant's share of the sale. If the cash for the entire sale remains in the hands of the tenant temporarily, he debits cash for the entire amount received, at the same time debiting Rent Adjustment and crediting the landlord for the latter's share. Later, he credits Cash and debits the landlord as payment is made to the latter, thus leaving both the Cash and Landlord's account in the same condition as if the landlord had taken the cash at the time of sale.

This process of charging the Rent Adjustment account is repeated as often as sales occur during the year, thus decreasing the credit balance of Rent Adjustment account from time to time. In a good year, the credit balance would probably be reduced to Zero, and a debit balance accumulated as a result of sales. This would mean that the amount of the rent was in excess of what the fair average cash rent would have been in that year. At the close of the year, any debit balance of this nature remaining in the account would be closed into Loss and Gain account. It is an undistributed loss to be set against all the income from the year. It should not be considered as increasing the cost of production of any crop or class of livestock.

Similarly, if crops are poor, so that the Rent Adjustment account has a credit balance at the close of the year, such credit should be closed into Loss and Gain account, ap-

pearing therein as an unexpected income—a sort of rebate because of poor crops or poor prices. It should not be credited to the several crop accounts to reduce their cost of production. *The cost of production is an element that should not vary with the selling price of the commodities produced.*

It is because of the fact stated in the preceding sentence that share rent is treated in the way presented in the several preceding paragraphs. If any other method were used, it would usually result in waiting until a sale was made before charging a crop account with the rent. The rent so charged would vary so much from year to year, that there would be no sound basis for comparison of production costs in a given field, one year with another. Likewise, there would be no reasonable basis for comparing production costs on a share-rent farm with a cash-rent farm, or with one operated by the owner.

The foregoing treatment of share-rent assumes that the tenant owns all equipment and livestock. It also assumes that the sales of crops and livestock are made to about the same extent in each fiscal year. That is, it assumes that about the same proportions of the total crops and total livestock are sold before calculating the loss or gain of each year.

If the latter assumption were not made the balance of Rent Adjustment account would not show the difference between the normal cash rent and the actual share rent of the year. It would reflect largely the selling policies, being influenced considerably in any year in which crops were held over into the succeeding year, for better prices.

If the landlord owns half of the livestock, half of the equipment or both, only the tenant's share of such livestock and equipment is recorded in the books of the tenant.

Under such conditions the Equipment Expense account is debited at the beginning of the year with an amount to

represent the use of the landlord's equipment. This makes it possible to have about the same amount of equipment expense to charge to the various fields as when the tenant owns all of the equipment. As a result, the cost of producing crops on a share rent farm can be compared on a common detailed basis with the cost on a cash rent farm or on one operated by the landlord.

Equipment Expense.—It has been fairly established by experiment that the use of a machine on a field or other farm element is nearly in proportion to the number of horse hours spent on that field or farm operation.¹ For example, if the horse labor record shows that horses worked 10,000 hours during a given year, and that 1000 of those hours were charged to Field No. 1, then Field No. 1 should bear $1/10$ ($1,000 \div 10,000$) of the wear on that class of equipment drawn by horses. This rule results in a very fair distribution of machine charges over the different farm elements.

An account is kept with Equipment Expense. To this is charged all repairs, depreciation, interest on investment and other expenses in connection with upkeep of farm equipment. At the close of the year the debit balance of the account is ascertained preparatory to distributing it over the farm elements. For effecting such distribution, the total horse hours worked by the proprietor's horses, as per horse labor summary for the year, is divided into the balance of the Equipment Expense account. This gives the machine cost per hour to be charged over the various accounts shown on the horse labor summary. This cost per hour is multiplied by the number of hours charged against each account. It assumes that for every hour a horse works on some farm element some equipment is used also.

¹ By permission of Mr. F. A. Pearson, Dairy Husbandry Dept., University of Illinois Agricultural Experiment Station.

ILLUSTRATION 53

YEARLY HORSE LABOR SUMMARY USED AS A BASIS
FOR DISTRIBUTING—EQUIPMENT EXPENSE

	House- hold	Swine	Gen- eral Exp.	Cattle	Field No. 1	Field No. 5	Total
Mar.....	73	25	26	8			132
Apr.....	74	26	35	12	240	30	417
<hr/>							
etc. for year							
Total Hours for yr.....	1,160	410	530	415	802	683	4,000
Total Cost for yr. for Horse Labor	\$116.00	\$41.00	\$53.00	\$41.50	\$80.20	\$68.30	\$400.00
Cost for Equip- ment use..	\$58.00	\$20.50	\$26.50	\$20.75	\$40.10	\$34.15	\$200.00

¹ See "Horse Labor Record," page 232.

For example, if the horse labor record for the year shows the totals indicated in Illustration 53, and the balance of Equipment Expense account is \$200 at the close of the year, the machine cost per hour is \$200 divided by 4000, or 5 cents. This means that for every hour horses are used in connection with a farm element, such element is responsible for 5 cents' worth of repairs, depreciation and interest on the equipment.

Applying this 5 cent rate to the farm elements recorded in the yearly Horse Labor Summary of Illustration 53, the household is charged with 1160 times .05, or \$58, for the use of equipment during the year. Likewise, the other ele-

ments using horse labor during the year are charged at a rate of 5 cents for every hour horses were employed thereon, in order to have each element bear its share of the cost of maintaining equipment.

The several charges for equipment use can be conveniently recorded in the yearly horse labor summary as shown in Illustration 53, where the \$58 charge to household, the \$20.50 charge to swine and other corresponding charges are shown at the foot of the illustration. The total, \$200, in the lower right-hand space represents the total cost in connection with equipment. The figures on the bottom line, just mentioned, express debits and credits, and as such may be posted direct from the Horse Labor Summary to the debit of the accounts named at the tops of the respective columns, and to the credit of Equipment Expense account.

The yearly Horse Labor Summary, then, as presented in Illustration 53, may be used at the same time as a posting medium for charging various accounts with the cost of horse labor and the use of equipment. It should be noted, therefore, that the amounts in the line next above the bottom line represent the cost of horse labor on the farm elements named at the tops of the columns. The sum of these charges for horse labor should equal the amount credited to the Horse account. In the illustration under discussion, \$400 is credited to Horse account and \$200 to Equipment Expense account. The latter credit should close Equipment Expense account for the year unless fractional parts of a cent are dropped in making calculations. The credit to Horse account closes the latter after the inventory is considered, unless a flat rate of, say, 10 or 12 cents an hour is used.

One very essential point is to be observed in using the horse labor summary as a means of distributing equip-

ment expense. It is that *the horse labor figures should be calculated, and the amounts posted to the several ledger accounts before any attempt is made to calculate even the total of equipment expense. This is because all of the expenses in connection with equipment are not in the Equipment Expense account until the cost of horse labor on equipment has been posted from the horse labor summary.*

When all the necessary charges for the year have been made in the Equipment Expense account, then the distribution of such expense is made over the several farm elements as indicated in Illustration 53 and as described above. After the distribution is made in the Horse Labor Summary, the items are posted to the accounts affected.

The method of calculating, recording and distributing Equipment Expense as described above includes all expenses in connection with equipment, both that drawn by horses and that used entirely by hand. In other words it includes hand tools. Theoretically it should not. Practically, however, distributing expenses of hand tools on a basis of horse hours is justified very largely because such tools are used for repairing horse drawn equipment. Any expense on tools not so used is so small that the distribution explained above may be used for all equipment expense without fear of distorting the results. Its simplicity warrants its use without modification.

Work Horses and Other Horses.—A distinction is sometimes made between the cost of keeping Work Horses and the cost of keeping Other Horses. Such distinction is not necessary on the average farm where only enough colts are raised or extra horses kept to insure the keeping of work up to a general standard, without unwarranted delay during rush seasons of the year.

Work Horses are kept for the purpose of assisting in the general farming operations. Work Horses account is charged with the cost of keeping horses that do farm work

at any time during the year. Such expenses of maintenance are ultimately charged to the farm elements through the yearly Horse Labor Summary.

Other Horses are kept primarily for the purpose of making a profit from their sale. Other Horses account is charged with the cost of keeping horses that are not raised as work animals. Expenses charged to Other Horses are absorbed at the time of sale; if not, the account shows a loss. A profit results when the sale price of, or other income from Other Horses exceeds the cost of raising or maintaining them after considering the inventories at the beginning and close of the year. The balance of the account with Other Horses is closed into Loss and Gain account.

Deferred Charges.—There is a class of inventory used in cost accounting which does not represent specific units of property that can be enumerated. The items in this class, however, are inventories in the sense that they are "sold" from one period to the next. They are better known as "deferred charges."

An example of such a deferred charge is fertilizer applied to a field and charged to it on the books. If the entire cost of the fertilizer were considered as an expense of that field or crop in the year in which it is applied, the current year's crop would be charged with something it did not use. For the same reason the following year's crop would get the use of something for which it would not be charged. In order to place the charges where they belong, the value of fertilizer unexhausted at the close of the year is determined with reasonable accuracy and "sold" to next year's crop. The "sale" is recorded in the same way as the inventories of livestock, namely, a credit above the double lines and a debit below.

Other common deferred charges are interest or insurance premiums paid in advance. For the average farmer the

latter two are of so little importance that they can be ignored. If, however, a three-year fire insurance policy is held, arrangement should be made to charge only one-third of the total premium against the operations of each of the three years.

Manure.—The several classes of livestock are given credit for the value of the manure produced during the year. As the manure is hauled from the barn yard, the proper field accounts are charged. A fair value to place on manure for purposes of these debits and credits is one dollar a ton.¹

If practically the same quantity of manure is produced and hauled during a given year, the entries stated above charging the field accounts and crediting the livestock accounts are sufficient. When any considerable amount is produced in excess of the amount hauled away, such excess should be considered as a deferred charge or inventory for the proper livestock account. In this way the livestock account is credited with it in the year of its production, and it is brought down in the account below the double lines after closing, in the same way as the inventory of livestock. The inventory thus carried down to the debit side of the appropriate livestock account will be balanced by a credit entry when the manure is hauled away.

As mentioned under the subject "Deferred Charges," a given application of manure is not a cost of raising one crop but several crops. It has been ascertained² that of an application of manure 40% is consumed by the first year's crop, 30% by the second, 20% by the third and 10% by the fourth.

Extraordinary Losses and Gains.—There are some expenses and incomes on a farm that cannot be assigned di-

¹ U. S. Dept. of Agriculture Bulletin 511.

² Montana Agricultural College Circular 43.

rectly to any of the so-called productive elements. They are closed into Loss and Gain account direct, instead of being distributed over various other accounts first. Fire Loss, which has been discussed in Chapter VII, is one of these. Others are commissions earned through agencies of various sorts, income from a threshing machine, corn shredder or other similar outfit.

If a farmer acts as an agent for silos, automobiles or some other articles, any commission received as a result of such agency should be credited to an appropriate income account until the close of the year, at which time the balance of the latter account is closed into Loss and Gain account. Commission from the sale of silos, for example, is credited to a Silo Commission account or to a Miscellaneous Income account. The former account is preferable. Any expenses incurred in connection with the sales are charged to the same account that receives the credit for the commission. If the farmer spends ten hours during the month of February in trying to sell silos, the labor record should show such time under the heading "Silo Commission" or "Miscellaneous Income." The proper charge would be made from the labor summary to the account named. The balance of the Silo Commission account would show the net income from the "side line," and would be closed into Loss and Gain account. A Miscellaneous Income account, if used in this way, might contain several different classes of information. If so, it would have to be analyzed in order to find the net result of any specific "side line."

Interest as an Element of Cost.—There is no other element of cost accounting that causes so much discussion and difference of opinion as the question of interest. Some consider that interest is an element of cost just as depreciation is. Others consider that interest is a distribution of the business profits, such profits having been

ILLUSTRATION 54

LOSS AND GAIN ACCOUNT WHEN INTEREST ON INVESTMENT HAS
NOT BEEN CHARGED AS A COST OF PRODUCTION.
(OTHER CONDITIONS SAME AS IN ILLUSTRATION 55)

Loss and Gain

Household.....	\$200	Oats.....	\$300
Net Gain to Capital		Corn.....	500
Account.....	1,400	Potatoes.....	400
		Swine.....	100
		Cattle.....	300
	<u>\$1,600</u>		<u>\$1,600</u>

determined after considering all elements of expense except interest on investment.

The application of either of these principles gives the same result in the end as far as the net addition to the Proprietor's Capital account is concerned. The difference between the two methods appears in the relative costs of conducting the several productive elements of the farm. If all productive elements required the same capital investment in land, equipment and buildings or other property, to produce a given net income, a consideration of the element of interest would be unnecessary as a basis for determining which farm element was the most profitable.

As a matter of fact, a greater investment in land, buildings or equipment is required to produce commodities of a given value from one productive element than from another. This being the case, it is reasonable to consider that the productive elements requiring the greatest investment should be charged with some amount to represent its relatively greater requirements in the way of capital.

ILLUSTRATION 55

LOSS AND GAIN ACCOUNT WHEN INTEREST ON INVESTMENT HAS
BEEN CHARGED AS A COST OF PRODUCTION
(OTHER CONDITIONS SAME AS IN ILLUSTRATION 54)

<i>Loss and Gain</i>			
Household.....	\$200	Oats.....	\$250
Net Gain to Capital		Corn.....	400
Account.....	1,400	Potatoes.....	375
		Swine.....	60
		Cattle.....	210
		Int. on Invest.....	305
	<hr/>		<hr/>
	\$1,600		\$1,600
	<hr/>		<hr/>

Illustrations 54 and 55 show Loss and Gain accounts of a farm at the close of a fiscal year, bringing out the difference in results when interest is not charged as a cost of production and when it is so charged.

The Interest on Investment income item of \$305 in Illustration 55 arises as a result of entries charging crop and livestock accounts and crediting Interest on Investment. The charge to the productive elements is made through Equipment Expense, Building Expense and General Expense accounts.

A comparison of the figures in Illustrations 54 and 55 shows that the net income from each of the various productive elements is less in the latter case when interest is charged as an element of cost. The total decrease in income from the productive elements is exactly offset by a corresponding increase in another nominal income called "Interest on Investment." The total income, however, is the same, \$1600 in each case. Examining the figures further, it appears that the interest charges over the several pro-

ductive elements in the farm under consideration, in Illustrations 54 and 55, were as follows:

Oats.....	(\$300—\$250)	\$50
Corn.....	(\$500—\$400)	100
Potatoes.....	(\$400—\$375)	25
Swine.....	(\$100— \$60)	40
Cattle.....	(\$300—\$210)	90
		<hr/>
Total Interest on Investment, as per		
Illustration 55.....		\$305
		<hr/>

These interest charges are not the same relatively for each productive element, hence a charge for interest as an element of cost on the farm in question is justified. Corn, for example, used four times as much property in its production as did potatoes. Therefore it was charged with \$100 for the interest on that property, while potatoes were charged with only \$25 for interest on capital used in their production.

Labor Income and Capital Income.—It is sometimes stated that the labor income (income due to management) cannot be distinguished from capital income (income as a result of investing capital in the business), unless interest is charged as part of the cost of production.

An analysis of Illustrations 54 and 55 may tend to indicate how labor income of the farmer is distinguished from capital income when interest is not considered as an element of cost. Such analysis is presented in Illustrations 56 and 57.

It is noted from a comparison of the main results obtained in Illustrations 56 and 57 that when interest is not charged as an element of cost, the income due to management, and income as an individual can be obtained readily by a simple calculation involving only the items in the

ILLUSTRATION 56

LABOR INCOME AND CAPITAL INCOME DETERMINED FROM LOSS
AND GAIN ACCOUNT OF ILLUSTRATION 54 WHEN INTEREST
WAS NOT CHARGED AS A COST OF PRODUCTION

Income from Oats.....	\$300
Income from Corn.....	500
Income from Potatoes.....	400
Income from Swine.....	100
Income from Cattle.....	300
	<hr/>
Gross Income.....	\$1,600
Less Interest on Investment (calculated from property accounts) ¹	305
	<hr/>
Net Income as a farm manager.....	\$1,295
Less Household Expense.....	200
	<hr/>
	\$1,095
Add Interest on Investment.....	305
	<hr/>
Income as an individual including both interest on investment and remuneration for management and risk above laborer's wage previously charged to productive elements.....	\$1,400
	<hr/>

¹ See Interest on Land, Interest on Buildings, Interest on Livestock, and Interest on Equipment, post.

Loss and Gain account and the aggregate interest on capital investment.

The results obtained in this manner (Illustration 56) are the same, for "Income as an individual" and "Income as a farm manager," as the results obtained when interest is charged in the accounts as an element of cost (Illustration 57).

In both cases, the net income from management is \$1295,

ILLUSTRATION 57

LABOR INCOME AND CAPITAL INCOME DETERMINED FROM LOSS
AND GAIN ACCOUNT IN ILLUSTRATION 55 WHEN INTEREST
WAS CHARGED AS A COST OF PRODUCTION

Income from Oats.....	\$250
Income from Corn.....	400
Income from Potatoes.....	375
Income from Swine.....	60
Income from Cattle.....	210
<hr/>	
Net Income as a farm manager.....	\$1,295
Less Household Expense.....	200
<hr/>	
	\$1,095
Add Interest on Investment.....	305
<hr/>	
Income as an individual including both interest on investment and remuneration for management and risk above laborer's wage, previously charged to productive elements.....	\$1,400
<hr/> <hr/>	

and the net income as an individual, \$1400. These figures are based on the assumption that the household is charged with an amount representing interest or rent on the house, even when the productive elements are not charged with interest as part of the cost.

Interest on Land.—Interest on land being a fixed charge, it may be calculated and charged to the various accounts at any time during the year. Unless impractical in any special case, it is better to credit Interest on Investment account at the beginning of the year and debit the several fields, General Expense or Household with the appropriate amounts. Interest is figured at 4% on the value of the

land as shown by the Land account at the beginning of the year under review.

The amount of interest on each area of land on the farm is calculated at 4%¹ for the year. The entries are then made on a basis of the amounts so calculated. The field accounts are charged, each with its amount; the Household or Garden is charged with the interest on the area occupied by the garden and house yard; and General Expense is charged with the amount calculated for the barnyard area. In addition to these charges, Swine are charged with the interest on the hog lot, Orchard and Timber accounts respectively are charged with interest on the tracts of land occupied by them, and any other farm elements having exclusive use of a particular area of importance are charged with interest on the areas so used.

Interest on the barnyard area is charged to General Expense because the latter account is ultimately distributed over the productive elements of the farm. It is considered, for this purpose, that the barnyard is for the general benefit of all farming operations.

Interest on an area used by cattle or sheep as pasture is not charged to the cattle or sheep direct. It is charged to the pasture, such charge being absorbed by the cattle or sheep later, when they are charged with a certain amount per pasture day as explained under "Pasture."² The hog lot could be treated in this way instead of the way suggested above.

Interest on Buildings.—The principles governing the calculation of interest on land apply also to interest on buildings. Such interest is credited to Interest on Investment, and charged to Building Expense. The latter account is closed into the accounts of the farm elements for the benefit of which the buildings are used.

¹ See Appendix.

² Page 257.

In this process of closing, expense on the house is charged to the Household; expense on a hog house, to the Swine; expense on a horse barn to the Horses; expense on a silo to Silage; expense on an implement shed to Equipment Expense; and other charges in accordance with these principles. All of these charges except Swine and Household are ultimately distributed over the productive elements—Silage being charged out to the livestock, Equipment Expense to the crops, through the field accounts and so on.

Rent versus Interest.—The tenant farmer does not consider interest on land and buildings in his accounts. The rent paid by a tenant and charged to the various farm elements, as explained under Rent Distribution, takes the place to a certain extent of interest as charged by the landlord operator.

Rent in the accounts of a tenant takes the place of Interest on Investment, Building Expense including insurance and depreciation, taxes (on Real Estate), and a few General Expense items (as fence repairs) in the accounts of the landlord operator.

Interest on Mortgaged Property.—The statements made above concerning interest on land and buildings apply to such properties when free from mortgage obligations. When the property is mortgaged, interest paid on such mortgage constitutes a charge against the operations of the business. Accordingly the procedure in the case of mortgaged real estate or equipment is modified so as to avoid charging interest twice over the farm elements.

In the case of mortgaged property, the same procedure is followed as in the case of unmortgaged property, but there is also one additional point to be considered. The additional point relates to the method of handling payments of interest on the mortgage. Interest paid on a mortgage is debited to Interest on Investment account either at the time of payment or by transfer entry from

Interest on Mortgage account at the close of the year. This leaves the accounts of the productive elements charged with the same amount of interest that they would contain if there were no mortgage on the property. Interest on Investment account having a credit balance will show an income. The income shown, however, will be less than if the mortgage did not exist.

Interest on Livestock.—Both the landlord and tenant farmer consider interest on livestock as an element of cost. In either case, Interest on Investment is credited and the appropriate livestock account charged with 4% on the investment at the beginning of the year. Fractional parts of a year may be considered in some cases, as in buying stock to feed for market. The interest on draft animals is ultimately absorbed by the productive elements when the total cost of maintaining them is charged over the several accounts at the close of the year, as explained under "Horse Labor Record" and "Exchange Labor."

After charging the Swine account, for example, with interest on the investment in swine, use of the buildings, feed, labor and any other charges, and crediting it with income of all sorts, the balance of the account (if a credit) shows the income due to the farmer for the risk involved and to compensate him as a manager. He has already considered his compensation as a laborer by the regular charge of \$600 for the year, part of which was charged to Swine account through the labor record. If the account shows no balance, it means that he has been compensated for his time as a laborer, and for his investment, but that he has received nothing for his managing ability, nor for his risk of operation. The same principles would apply to cattle, sheep or poultry.

Interest on Equipment.—The amount of interest on equipment is charged to Equipment Expense account and credited to Interest on Investment Account. Such an en-

try is made at the close of the fiscal year before distributing the Equipment Expense over the various farm elements using equipment, as presented in Illustration 53.

The amount of the interest for the year is found by taking 4% of the value of equipment at the beginning of the year. In special cases, it is permissible to consider interest for portions of a year when expensive pieces of machinery are bought during the year. For example, if \$500 worth of equipment is purchased on Sept. 1, interest at 4% on \$500 for 6 months to February 28 (\$12.50) may be considered in addition to the interest calculated as described above, on the equipment balance at the beginning of the year.

Another way of calculating interest on equipment is to take 40%¹ of the charge for depreciation as shown in the Equipment Expense Account. After making the calculation in this way, however, the entry is made in the same way as when the amount is calculated on the equipment value itself.

Interest on Working Capital.—As previously stated, interest on land, buildings, livestock and equipment is considered as an element of cost largely for the purpose of charging the farm elements with an expense proportionate to the amount of capital used. If this principle were to be followed out in detail, it would be necessary to charge the several farm elements with interest on working capital used in their production.

For this purpose, *working capital includes the amount of capital tied up in the production of a crop or in raising livestock, aside from the capital invested in land, buildings, livestock or equipment. Such working capital in the case of a crop is best illustrated by seed, labor, horse labor and other elements of expense incurred in sowing, culti-*

¹ Calculation derived from figures presented in U. S. Dept. of Agriculture Bulletin No. 338.

vating and harvesting a crop. Similar expenses for feed, labor, and miscellaneous items might be enumerated in the case of livestock. In either instance, a certain amount of capital is required to produce a crop or raise livestock, aside from the elements of property previously mentioned.

Theoretically, interest on the capital paid for labor, feed and other items should be charged to the crops or livestock. Practically, it is not considered of sufficient importance to pay for the time and difficulties of calculation. For a purely scientific investigation, such interest should be considered. For practical farming purposes, it should not be considered, as its relative effect upon different farm elements is about the same.

The Process of Closing.—It is stated in the discussion of various accounts that they are closed at the end of the fiscal year into other accounts, in order to give certain results. Such statements require slight explanation in order to have the closing made without confusion of entries or accounts.

The principles governing the closing under a cost system are logical. In order to view them logically one has only to ask himself the object of closing. The answer is: "In order to distribute the costs of production over the productive elements on the farm." Such a distribution is necessary to find the profit from the operation of each productive element, the incomes having been credited to the proper accounts direct at the time they arose.

Expenses in farming are divisible into two classes (1) direct and (2) indirect. In general, direct expenses on any productive element consist of those that have a definite known value at the time they are incurred. Indirect expenses on any productive element consist of those whose value is not known or certain at the time they are incurred. Examples of direct expenses are man labor, horse labor, seed, fertilizer and similar items in connection with crops;

and man labor, horse labor, feed and similar items in connection with livestock. Indirect expenses are represented by such items as depreciation, interest and general expense.

Under a cost system, the so-called closing entries include those made for the purpose of distributing the indirect expenses over the productive elements. In addition, there are other entries which are recorded only once a year, and which form part of the process of closing, but which do not involve indirect expenses. An example of this latter class is the entry made at the close of each year debiting Labor and crediting Household for the value of the family labor.

General Plan of Closing.—At the close of the year after completing the labor and feed records and recording the debits and credits in the cash journal for the last transaction of the last day of the fiscal year, the next step is to find the net results to be shown by the mass of data collected during the year. Such net results portray the progress during the year as shown in the Loss and Gain account, and the condition at the close of the year as shown in the Statement of Resources and Liabilities.

The general plan of assembling the costs in the proper accounts in the ledger may be outlined as follows:

1. Record labor of the family for the year.
2. Take an inventory and record it in the Inventory Record book.
3. Charge interest on investment and depreciation over the productive elements through the accounts Equipment Expense, Building Expense and so on. At the same time, interest on livestock is charged direct to the proper livestock accounts.
4. Charge feed consumed during the year to the livestock. (This entry is posted from feed record.)
5. Charge man labor and horse labor over the various farm elements.

6. Charge crop accounts with the cost of production, as shown in the several field accounts.

7. Charge any remaining undistributed expenses or costs over the productive elements through General Expense account.

8. Close loss or gain on each productive element or "side line" into Proprietor's Capital account through Loss and Gain account, bringing down the inventory in each productive account, ready to start the next year.

Detailed Procedure in Closing.—In order to accomplish the main objects in closing, it is necessary to follow a given definite order in making the entries. For that reason, the following details are suggested in connection with closing:

Presume that rent or interest on land have been distributed at the beginning of the year, as suggested under "Rent Distribution," "Interest on Land" and "Interest on Buildings."

Beginning after the last entry for the regular transactions of the year has been entered in the cash journal; and after the quantities and values have been recorded in the labor, horse labor and feed records, perform the following operations:

1. Make entry in cash journal debiting Labor and crediting Household with the value of labor performed by members of the household, including the operator, in connection with farming operations (\$600 a year for each adult is a conservative figure to use for this purpose).

2. Post all entries from the cash journal to the ledger, including totals of special columns.

3. Take a trial balance of the ledger, to test accuracy of work before closing.

4. Inventory all equipment, livestock, products and miscellaneous supplies and enter them in the Comparative

Inventory Record, as explained in Chapter 6, and as presented in Illustration 27.

5. Calculate and enter interest on investment for the year, as follows:

(a) Calculate interest on equipment and make an entry in cash journal, debiting Equipment Expense and crediting Interest on Investment.

(b) If a landlord, calculate interest on buildings and charge Building Expense, crediting Interest on Investment. Interest on land is charged at the beginning of the year as explained under "Interest on Land," in this chapter.

(c) Calculate interest on livestock, charging the several respective livestock accounts, crediting Interest on Investment.

(d) Calculate and enter interest on any special equipment or buildings not covered by (a) and (b) above. This includes silos, special dairy equipment and similar units.

6. Calculate and enter depreciation on property for the year as follows:

(a) Calculate depreciation on equipment and make an entry in the cash journal debiting Equipment Expense and crediting Equipment.

(b) If a landlord, calculate the depreciation on buildings, debiting Building Expense and crediting Buildings.

(c) Calculate and enter depreciation on any special equipment or buildings not covered by (a) and (b) above. This includes silos, special dairy equipment and similar units.

7. Post everything that has been entered in the cash journal up to this point.

8. Charge out the feed consumed by livestock during the year by posting the values shown in the feed record to the debit of the several livestock accounts and to the credit of the crop accounts.

9. Post from the labor and horse labor records to the

several accounts affected, being sure that the debits equal the credits in each of the summaries before posting. When a flat or estimated hourly rate is not used for horse labor, it is necessary to complete the posting from the Labor Summary before calculating the value of the horse labor per hour.

10. Find the net charge to Building Expense account for the year. Distribute this expense over the various farm elements using the buildings to any considerable extent. This distribution is made rather roughly to apply to the household, each class of livestock, corn, silage and equipment. Post the entry.

11. Find the net charge to Equipment Expense account for the year, by referring to the account in the ledger and considering inventories of miscellaneous supplies as per Inventory Record. Distribute this expense over the various farm elements by making proper apportionments in the Horse Labor Summary as described under "Equipment Expense" and in Illustration 53. After making these entries, make sure that the debits and credits expressed are equal; then post them to the accounts indicated.

12. Calculate the inventories of fertilizer, labor and other charges to field accounts, which are to be carried over to next year's operations. Enter these in the field accounts in the regular way. The resulting balance in each field account is the cost of producing this year's crop on that field. In order to transfer these costs of producing crops to the crop accounts, an entry is made in the money columns, debiting the several crop accounts and crediting the respective field accounts. The entries have previously been made in the explanation columns at time of harvest. (See also "Operation of Field Accounts" and Illustration 52.)

13. Examine all expense accounts. If a balance remains in any of them after making proper entries for miscel-

laneous supplies inventories or deferred charges, transfer such balance to General Expense account. This applies especially to Labor, Exchange Labor, Equipment Expense, and Silage. The transfer is made by entry in the cash journal.

14. Post all entries made under instructions 12 and 13 above, bringing down any inventories recorded under the Field, Silage, Equipment Expense or other accounts.

15. Close General Expense account after considering miscellaneous inventories or deferred charges, distributing its balance over the several productive elements (crops and livestock). This being a small item, usually, it is more practical to apportion it over the several crop and livestock accounts arbitrarily than to attempt a careful, more scientific distribution. As an illustration, if wheat, hay and cattle are the major elements on a given farm, they should bear a large share of the general expense, leaving only a small share to be borne by the less important crops and livestock. Having decided on the amount to be charged to each productive element, make an entry in the cash journal, debiting the several crop and livestock accounts and crediting General Expense with enough to balance it.

16. Post the entries made under instruction 15, ruling off each account in the ledger whose total debits equal its total credits.

17. At this point, all the accounts remaining open or that have inventories brought down after closing should represent either resources, liabilities (including Capital account), or the transactions with productive elements, Household, Horses, or extraordinary gains or losses. In order to find the aggregate net gain or loss for the year, find the net gain or loss on each productive element, and transfer it to the Loss and Gain account. The inventory in each productive element is credited to its appropriate account before closing and is brought down on the debit side

of the same account after the latter is ruled off. The same is true of the Household and Horses accounts. (Any extraordinary expenses or incomes which are to be carried direct to Loss and Gain account are closed into it at this time. Fire Loss and commission as agent are illustrations.)

18. The net balance of Loss and Gain account should be transferred to the Proprietor's Capital account or to the Partners' Capital accounts as the conditions require.¹

19. Rule off the Capital account and bring down the net balance.

20. Take a Trial Balance after Closing, to test the accuracy of the closing process. Incidentally, it shows the resources and liabilities of the business at the close of the year, including the proprietorship.

Modifications of Cost System.—The operation of a cost system as outlined in this and the preceding chapter is simpler in some details than would be advocated for the most accurate results on a large farm or for some experimental purposes. However, there are occasions when a farmer might feel the need of a fair distribution of costs over the productive elements without keeping even such detailed records as have been described herein.

It may be said that a farmer feeling unable to keep his accounts in a way exactly as presented in the two chapters on Cost Accounting should at least try to keep accounts that will show in a general way the relative results of the several productive elements of the farm. In doing this the farmer should use the same general principles but use more estimates than are used in the system studied up to this point. In other words, he should keep accounts with the household and each productive element, and such other accounts as are needed. He should charge each productive element with some amount to represent labor, horse labor,

¹ See "Loss and Gain account," pages 44-48, and "Closing Entries of Partnership," pages 185-186.

feed (in case of livestock), depreciation of equipment and buildings, rent or interest on investment. He ought to keep a comparative inventory record also. He could get along without a feed record, a labor record, or a horse labor record.

If one operated under such a curtailed cost system it would mean that he would make practically the same entries in the cash journal and in the ledger, and that the closing entries would be the same in principle as under the more detailed system. The saving of time would come in the omission of some of the subsidiary records. For instance, feed and fertilizer, labor and horse labor would be distributed to the several livestock and field accounts at a reasonable estimated value. All labor could be charged to Labor account as usual, and at the close of the year the total labor could be distributed over the farm elements more or less arbitrarily, based on experience or observation. Such distribution, however, would require an entry crediting Labor account and debiting the several farm elements. The same method could be followed in connection with horse labor.

Feed consumed by livestock could be estimated or an occasional test could be made to form the basis for an entry at the close of the year debiting the several livestock accounts and crediting the several crop accounts. The total depreciation on equipment could be distributed over the various farm elements on the same basis used for horse labor. Other charges could be made by estimate, following the same general plan.

Obviously, any results obtained under such an abbreviated cost system could not be considered as showing the results to the best advantage. Estimates made on such a large scale are subject to errors. If one intends to use such a system involving estimates so largely, it would be much better if he would keep all of the detailed records for

a few years first. After keeping such records he would then have data available that would be of material benefit in making estimates for the same farm in one or two succeeding years.

Another modification in the operation of a cost system consists in the elimination of field accounts. Such a method causes the crop accounts to be charged direct with all costs incurred in their production, harvesting and sale. This method is open to the criticisms mentioned under Field Accounts, General.

After the Books Are Closed.—After the details of closing have been followed out as outlined above, the ledger accounts are in a position to start the next year's business. They are also in condition for further analysis or interpretation. The most common forms of analysis and interpretation have been presented in connection with the study of the Loss and Gain Statement, Statement of Resources and Liabilities, Farm and Individual Loss and Gain Statement, and Change of Wealth Statement. Other methods of analyzing and interpreting accounts are presented in the next chapter, "Interpretation of Cost Accounts."

ILLUSTRATIVE PROBLEMS CHAPTERS VIII AND IX

(Problem 1 may be assigned after a study of Chapter VIII, but Chapter IX should be studied before the problem is completed.)

Note.—Problem 1 is intended to illustrate the operation of a partial cost system resulting in the determination of departmental costs without finding some of the results essential to good farm management. That is, it provides for proper distribution of feed, labor, horse labor, depreciation, interest, etc., over the productive elements, but does not show costs of production in the several fields. This method is followed here primarily to

afford a better comparison with Fay's results under the General Accounting System as in problems 3 and 4 of Chapter VII.

1. Mr. L. E. Fay, who has been farming for several years as a tenant, decides to keep accounts of his transactions under a cost system. Accordingly, he arranges to use a cash journal and ledger and monthly labor, horse labor and feed records, beginning with his new lease, on Jan. 1, 1916, using the following columns in the cash journal in the order named: Debit:—Labor, Roy Wade, Household, Cash, Sundry. Credit:—Sundry, Cash, Household, Roy Wade, Poultry and Cattle.

He valued his possessions and prepared a Statement of Resources and Liabilities, as follows:

STATEMENT OF RESOURCES AND LIABILITIES

JAN. 1, 1916. L. E. FAY

<i>Resources</i>		<i>Liabilities</i>	
Cash.....	\$800	Watt Hdw. Co.....	\$150
Household furnishings..	500	Mortgage Payable.....	2,000
B. E. Adams.....	60	L. E. Fay, Cap.....	3,430
Notes Rec. (Atwood)...	200		
Horses.....	800		
Cattle.....	600		
Hogs.....	350		
Sheep.....	150		
Poultry.....	30		
Bran, shorts, etc. (Dr.			
Mill Feed).....	40		
Corn.....	500		
Oats.....	100		
Wheat.....	250		
Hay.....	200		
Equipment.....	1,000		
	<hr/>		<hr/>
	\$5,580		\$5,580
	<hr/>		<hr/>

In order to reduce the details of the problem, the inventory record of Mr. Fay is not to be used.

Make the necessary entries in the books of original entry to open the books of Mr. Fay; and then proceed to record his transactions for the year, as detailed below.

TRANSACTIONS

Jan. 2. Gave two promissory notes to landlord for \$250 each, in payment of year's rent,¹ one due Sept. 1 and one Dec. 15, 1916, without interest.

Jan. 3. Spent \$10 for household supplies.

Jan. 16. Sold corn for \$140 cash.

Jan. 31. The household received during the month, \$5 worth of dairy products and \$1 worth of eggs. (Credit Cattle and Poultry accounts respectively.)

Jan. 31. Butchered for household use, four hogs valued at \$50.

Feb. 1. Paid interest on mortgage for six months, \$60. (Debit Interest on Investment.)

Feb. 11. Bought for cash two horses at \$150; and two sets of harness at \$19.50. (Harness is considered as equipment.)

Feb. 16. Received a 60 day note, bearing interest at 6%, from B. E. Adams to settle his account.

Feb. 28. The household received during the month, poultry valued at 90c, eggs valued at \$1.15 and dairy products valued at \$6.

Mar. 4. Sold wheat for \$175 cash.

Mar. 4. Paid cash for groceries, \$6.

Mar. 4. Paid personal taxes, \$35.67.

Mar. 31. The household received during the month, poultry valued at 95c, eggs valued at \$1.10 and dairy products valued at \$6.40.

Apr. 3. Paid for repairs to wagon and corn planter, \$2.25.

¹The total rent of \$500, in this case, is not distributed over the farm elements until the close of the year. This is made necessary by the fact that accounts with fields are not kept in Mr. Fay's cost system. Accordingly, a distribution at the beginning of the year is not feasible, as it is not known in advance in all cases just what crops are to be planted on certain fields. Debit Rent account with \$500.

Apr. 16. Received cash from B. E. Adams to redeem his note of Feb. 16th¹ and to pay interest on same.

Apr. 30. The household received during the month, poultry valued at 80c, eggs valued at 90c and dairy products valued at \$5.30.

May 1. Arranged with Roy Wade to work by the month until December 1st for \$30 a month and his board, room and laundry. It is agreed that he can draw his wages in installments of not less than \$5 at any one time after he has earned them.

May 5. Received cash from A. M. Atwood for note due today, with interest on same at 6% per annum from December 5, 1915.

May 6. Paid Watt Hdw. Co. in full of account, \$150.

May 25. Decided to discontinue the raising of sheep, so sold all the sheep for \$230 cash.

May 25. Roy Wade drew \$10 on account of wages.

May 31. Sold part of the hay for \$95.

May 31. The household received during the month, poultry valued at 70c, eggs valued at \$1.30 and dairy products valued at \$7.

May 31. Credited Roy Wade with wages for May, \$30.

May 31. The household values the board, room and laundry of the hired man during May at \$20.

June 1. Paid \$30 for bran and shorts.

June 8. Roy Wade drew \$20 on account.

June 10. Bought sundry supplies for house, \$16.50, of which \$13 was paid in cash, \$2.50 in butter, and \$1 in eggs. (Cr. Household for the \$2.50 and \$1.)

June 10. Bought nails, bolts, etc., for repair of equipment, \$1.15 cash.

June 10. Bought a new hat and suit of clothes for \$27.50 cash.

June 30. The household received during the month, eggs valued at 50c and dairy products valued at \$5.60.

June 30. Credited Roy Wade with wages for June, \$30.

¹ In figuring 60 days from February 16, it should be remembered that 1916 was a leap year.

June 30. The household values the board, room and laundry of the hired man during June at \$20.

July 3. Paid for binder twine for oats crop, \$19.50.

July 3. Roy Wade drew \$30 on account.

July 4. Spent \$7.40 for sundry expenses in town at holiday celebration.

July 8. Deposited \$500 in savings account at State Trust & Savings Bank. (Debit State Trust & Savings Bank; credit Cash.)

July 15. Paid for extra help during the haying season, \$9.30. (Dr. Labor.)

July 22. Bought groceries for cash, \$16.

July 31. The household received during the month, eggs valued at 35c, and dairy products valued at \$3.40.

July 31. Credited Roy Wade with wages for July, \$30.

July 31. The household values the board, room and laundry of the hired man during July at \$20.

Aug. 1. Paid interest on mortgage, \$60. (Dr. Interest on Investment.)

Aug. 6. Paid for sundry small tools, \$6.30.

Aug. 16. Paid for threshing coal for oats crop, \$4.27.

Aug. 18. Sold 520 bushels new oats at \$0.53 cash.

Aug. 23. Sold some corn for \$150 cash.

Aug. 23. Bought groceries for cash, \$19.50.

Aug. 31. The household received during the month, eggs valued at 60c, and dairy products valued at \$3.

Aug. 31. Sold eggs for 90c cash during August.

Aug. 31. Credited Roy Wade with wages for August, \$30.

Aug. 31. The household values the board, room and laundry of the hired man during August, at \$20.

Sept. 1. Paid \$250 to redeem note held by landlord due to-day.

Sept. 6. Bought bran, shorts, etc., for \$29 cash.

Sept. 6. Sold four calves for \$85 cash.

Sept. 8. Paid Roy Wade on account \$15.

Sept. 15. Paid for extra help during threshing season, \$4.50. (Debit Labor.)

Sept. 21. Paid fire insurance premiums, \$8. (Dr. General Expense.)

Sept. 30. The household received during the month, eggs valued at \$1 and dairy products valued at \$5.10.

Sept. 30. Credited Roy Wade with wages for Sept., \$30.

Sept. 30. The household values the board, room and laundry of the hired man during Sept. at \$20.

Sept. 30. Paid Roy Wade on account, \$15.

Oct. 6. Paid for winter clothes for self and family, \$86.50.

Oct. 10. Bought for cash two husking hooks, 40c; two corn knives, 60c; and one wheelbarrow, \$3. (Dr. Equipment.)

Oct. 21. Sold for cash, 30 shotes, 4500 lbs., at \$13 per cwt.

Oct. 31. Credited Roy Wade with wages for October, \$30.

Oct. 31. The household values the board, room and laundry of the hired man during October at \$20.

Oct. 31. The household received during the month, poultry valued at \$1.25, eggs valued at \$1.20, and dairy products valued at \$6.30.

Nov. 6. One cow valued at \$20 died and was buried on the farm.

Nov. 20. Sold some poultry for \$16.45 cash.

Nov. 30. Donated to the United Charities, \$10. (General Expense.)

Nov. 30. The household received during the month, poultry valued at \$2, eggs valued at \$1.10, and dairy products valued at \$5.90.

Nov. 30. Credited Roy Wade with wages for Nov., \$30, and paid him \$30 on account.

Nov. 30. The household values the board, room and laundry of the hired man during the month at \$20.

Dec. 3. Paid cash for bran, shorts, etc., \$26.

Dec. 3. Paid for buggy wheel, \$5.95; one pair trace springs, \$1; one wagon tongue support, \$1.70; one single tree, 60c; nails, screws and bolts, 70c; and two horse blankets, \$5.90. (All are to be charged to Equipment Expense.)

Dec. 15. Paid \$250 to redeem note held by landlord, due to-day.

Dec. 18. Sold some poultry for \$6.20 cash.

Dec. 18. Paid for incidental Christmas purchases, \$10.65.

Dec. 19. Paid Roy Wade on account, \$50.

Dec. 31. The household received during the month, poultry valued at \$1.40, eggs valued at 45c and dairy products valued at \$4.80.

Dec. 31. Mr. Fay places the value of his services as a laborer at \$600 for the year.

The feed records kept during the year showed commodities consumed, which have been calculated as bearing the values stated below. They are to be summarized in the Feed Record for the year as in Illustrations 49 and 50 and used as bases for journal entries under date of Dec. 31, 1916. (See closing instruction 7 at the close of the problem.)

JANUARY

Horses: corn, \$6.20; hay, \$8.30. Cattle: corn, \$10.30; hay, \$21.60. Hogs: corn, \$30. Sheep: hay, \$8. Poultry: corn, \$1.90; wheat, \$1.95.

FEBRUARY

Horses: corn, \$8.55; hay, \$12.75. Cattle: corn, \$9.10; hay, \$16.20; bran and shorts, \$8. Hogs: corn, \$25; wheat, \$6; bran and shorts, \$6. Sheep: hay, \$7. Poultry: corn, \$1.30; wheat, \$1.75.

MARCH

Horses: corn, \$14; hay, \$16; oats, \$5; pasture, \$2. Cattle: corn, \$7.35; hay, \$11.80; bran and shorts, \$7; pasture, \$3. Hogs: corn, \$26; wheat, \$4; bran and shorts, \$7. Sheep: pasture, \$10. Poultry: corn, \$0.90; wheat, \$1.

APRIL

Horses: corn, \$18.75; hay, \$21; oats, \$16; pasture, \$2. Cattle: corn, \$6.20; hay, \$10; bran and shorts, \$6.60; pasture, \$4. Hogs: corn, \$23; bran and shorts, \$4. Sheep: pasture, \$10. Poultry: corn, \$0.60; wheat, \$0.90.

MAY

Horses: corn, \$20.60; hay, \$18; oats, \$14; pasture, \$1.30.
Cattle: corn, \$4; pasture, \$3. Hogs: corn, \$20; wheat, \$5.
Sheep: pasture, \$8. Poultry: bran and shorts, \$1.20.

JUNE

Horses: corn, \$18; hay, \$16.70; oats, \$16.30; pasture, \$1.30.
Cattle: bran and shorts, \$6; pasture, \$5.60. Hogs: corn, \$18.60;
wheat, \$5.40. Poultry: wheat, \$1.

JULY

Horses: corn, \$23; hay, \$17; oats, \$16; pasture, \$1.10. Cat-
tle: bran and shorts, \$5; pasture, \$5. Hogs: corn, \$19; wheat,
\$7.20; Poultry: wheat, \$1.05.

AUGUST

Horses: corn, \$14; hay, \$13; oats, \$12.60; pasture, \$1.20.
Cattle: bran and shorts, \$6; pasture, \$4.20. Hogs: corn, \$20.10;
wheat, \$7. Poultry: wheat, \$0.95.

SEPTEMBER

Horses: corn, \$7; hay, \$10; oats, \$10; pasture, \$2. Cattle:
bran and shorts, \$4.50; pasture, \$6. Hogs: corn, \$25.30; wheat,
\$8. Poultry: wheat, \$1.20.

OCTOBER

Horses: corn, \$9; hay, \$14; oats, \$21; pasture, \$1.30. Cattle:
bran and shorts, \$7; pasture, \$4. Hogs: corn, \$25; wheat, \$6.
Poultry: corn, \$1; wheat, \$1.10; bran and shorts, \$2.

NOVEMBER

Horses: corn, \$11.20; hay, \$11; oats, \$17; pasture, \$1.80.
Cattle: bran and shorts, \$10; fodder (corn), \$4.80; pasture,

\$2.50. Hogs: corn, \$16; bran and shorts, \$10; wheat, \$4. Poultry: corn, \$1.30; wheat, \$1.30.

DECEMBER

Horses: corn, \$7; hay, \$9; pasture, \$2.50. Cattle: bran and shorts, \$8; fodder, \$5.70; hay, \$17; pasture, \$3. Hogs: corn, \$21; wheat, \$4.50; bran and shorts, \$8.50. Poultry: corn, \$1.05; wheat, \$2.10.

The monthly labor records for the year show the following hours worked, to be summarized in the yearly Labor Record as in Illustration 47, the totals of which are to be calculated¹ at 20 cents an hour and a journal entry made therefrom. (See closing instruction 8 at the close of the problem.)

JANUARY

Cattle, 45; hogs, 30; horses, 15; expense (General Expense a/c), 25; repairs (Equipment Expense a/c), 16; poultry, 21; sheep, 19; household, 40; corn, 18.

FEBRUARY

Cattle, 40; hogs, 27; horses, 26; expense, 30; repairs, 10; poultry, 16; sheep, 12; household, 21.

MARCH

Cattle, 28; hogs, 26; horses, 21; expense, 16; repairs, 15; poultry, 7; sheep, 10; corn, 8; oats, 6; household, 12; wheat, 21.

APRIL

Cattle, 30; hogs, 27; horses, 23; expense, 28; repairs, 6; poultry, 20; sheep, 5; corn, 15; oats, 48; hay, 16; household, 15.

¹The Labor and Horse Labor Conversion Table, Illustration 75, Appendix, may be used to assist in the calculation.

MAY

Cattle, 35; hogs, 22; horses, 20; expense, 60; repairs, 9; poultry, 15; sheep, 30; corn, 105; hay, 40; household, 28.

JUNE

Cattle, 37; hogs, 20; horses, 21; expense, 47; repairs, 15; poultry, 12; corn, 152; hay, 68; household, 16.

JULY

Cattle, 43; hogs, 18; horses, 18; expense, 23; repairs, 26; poultry, 10; corn, 175; oats, 80 of which 50 hours were worked by neighbors;¹ household, 12.

AUGUST

Cattle, 47; hogs, 17; horses, 19; expense, 25; repairs, 18; poultry, 7; corn, 27; oats, 165 of which 150 hours were worked by neighbors;¹ exchange labor, 120; household, 6.

SEPTEMBER

Cattle, 38; hogs, 16; horses, 22; expense, 68; repairs, 2; poultry, 6; oats, 14; exchange labor, 110; hay, 18; household, 10; corn, 5.

OCTOBER

Cattle, 46; hogs, 31; horses, 23; expense, 20; repairs, 5; poultry, 17; corn, 122; household, 35.

NOVEMBER

Cattle, 40; hogs, 12; horses, 11; expense, 16; repairs, 6; poultry, 17; corn, 188; household, 11.

¹The 50 and 150 hours worked by neighbors in July and August correspond to the 33 and 82 hours shown in parentheses in June and July respectively of Illustration 47. They are to be treated in the same way, resulting ultimately in a credit to Exchange Labor account.

DECEMBER

Cattle, 34; hogs, 11; horses, 10; expense, 16; repairs, 14; poultry, 18; household, 12.

The monthly horse labor records for the year show the following hours worked, to be summarized in the yearly Horse Labor Record similar to Illustration 47,¹ the totals of which are to be calculated at 10 cents an hour, and a journal entry made therefrom. (See closing instruction 9 at the close of the problem.)

JANUARY

Cattle, 6; hogs, 5; expense (General Expense a/c), 6; household, 12; corn, 36.

FEBRUARY

Expense, 7; household, 5.

MARCH

Expense, 3; household, 10; wheat, 42.

APRIL

Cattle, 2; hogs, 3; expense, 8; household, 6; repairs (Equipment Expense), 4; corn, 38; oats, 126; hay, 32.

MAY

Expense, 8; sheep, 30; corn, 260; hay, 80; household, 16.

JUNE

Expense, 15; repairs, 8; corn, 304; hay, 56; household, 13.

¹Space is to be reserved also at the bottom of the Horse Labor Record for showing the distribution of Equipment Expense as in Illustration 53, and in accordance with explanation given under instruction 11 at the close of this problem.

JULY

Expense, 3; corn, 350; oats, 240, of which 100 hours were worked by neighbors' horses; household, 22.

AUGUST

Cattle, 7; hogs, 4; expense, 3; corn, 54; oats, 345, of which 320 hours were worked by neighbors' horses; exchange labor, 200; household, 12.

SEPTEMBER

Expense, 24; oats, 28; exchange labor, 180; hay, 47; household, 11; corn, 15.

OCTOBER

Hogs, 28; expense, 25; corn, 244; household, 18.

NOVEMBER

Cattle, 3; expense, 12; poultry, 8; corn, 316; household, 14.

DECEMBER

Expense, 22; repairs, 7; poultry, 8; household, 14.

INSTRUCTIONS FOR CLOSING

(See also General Plan of Closing and Detailed Procedure in Closing near the end of Chapter IX.)

1. Post all entries from the cash journal to the ledger before framing journal entries from the yearly feed, labor and horse labor records, but after entering the \$600 for Fay's labor. Allow enough space for the transactions of problem 2 below which require the use of the same ledger accounts.

2. Take a trial balance to test the accuracy of the work before closing.

3. Make a journal entry debiting the accounts named below and crediting Rent to distribute the \$500 rent over the several farm elements, on a basis of the following percentages: House-

hold 3%, cattle 4%, hogs 5%, horses 4%, sheep 1%, poultry 2%, corn 34%, oats, 20%, wheat 1%, hay 13%. pasture 10%, equipment (debit Equipment Expense) 1%, miscellaneous elements, as barn yard, etc. (debit General Expense), 2%.

4. Calculate, and enter interest on investment for the year as follows:

(a) Debit Equipment Expense account and credit Interest on Investment with 4% of the value of equipment on hand at the beginning of the year.

(b) Debit each of the several livestock accounts and credit Interest on Investment with 4% of the value of each of the several classes of livestock on hand at the beginning of the year, except as modified in the following note:

Note.—Since all sheep were sold during the latter part of May, they should be charged (and Interest on Investment credited) with only five-twelfths of the interest on \$150 for a year.

5. Calculate and enter depreciation on equipment for the year, debiting Equipment Expense and crediting Equipment with 10% of the book value of equipment at the beginning of the year.

6. Post all the entries made under instructions 3, 4 and 5 above.

7. Charge out the feed consumed by livestock during the year by making a journal entry for the values shown in the feed record, debiting the several livestock accounts and crediting the crop accounts. Post the items in the entry just made.

8. Use the labor record as a basis for a journal entry, debiting the several accounts indicated therein and crediting Labor and Exchange Labor, each with the proper amount.

9. Use the horse labor record as a basis for a journal entry, debiting the several accounts indicated therein and crediting Horses and Exchange Labor, each with the proper amount.

10. Post the entries made under instructions 8 and 9 above.

11. (a) Distribute the balance of Equipment Expense account over the various farm elements on a basis of horse labor. This distribution is to be made as described under "Equipment Expense" and as shown in Illustration 53. In making these calculations, the hours shown in parentheses in the horse labor record are to be used. For example, if Illustration 47 contained

figures for the horse labor record in question, the Equipment Expense account balance would be divided by 2681. Assume that this division gave a result of .053, meaning that 5 cents to the nearest integral cent was to be charged for every hour the equipment was in use. The amounts to charge to the various accounts would be: cattle, 798 times .05; Field No. 1, 284 times .05; Exchange Labor 157 times .05 and so on.

(b) Make a journal entry expressing debits to the various accounts shown in the horse labor record and crediting Equipment Expense and Exchange Labor accounts with the amounts obtained in (a) above. Post the entry. (Since there is no inventory of Miscellaneous Supplies, in this problem, to affect Equipment Expense, the latter account would now be in balance with no inventory to carry down, if it were not for the fact that the fractional part of a cent was disregarded in the hourly rate.)

12. Make entries in the cash journal, closing any balances remaining in Labor, Exchange Labor and Equipment Expense accounts into General Expense account. Post the entry.

13. The inventory of mill feed is \$15. Record this in the account. Any balance left represents shrinkage or error in recording feed, and is to be transferred to General Expense account by entry in the cash journal. Post the entry, rule off the Mill Feed account and bring down the inventory.

14. Close Interest account into General Expense. Distribute the general expenses over the various productive elements by journal entry, crediting General Expense account with enough to close it and debiting each of the accounts representing productive elements with its fair share. For the purpose of securing uniformity charge the productive elements with the following proportions of the total: Cattle 5%, hogs 7%, poultry 3%, sheep 2%, oats 25%, hay 17%, corn 40%, wheat 1%. Post the entry.

15. Make entries direct in the accounts for the following inventories: household furnishings \$500; horses, \$1100; cattle, \$570; hogs, \$240; poultry, \$25; corn, \$830; oats, \$350; hay, \$290.

Transfer any balances remaining in the productive, Household

hold 3%, cattle 4%, hogs 5%, horses 4%, sheep 1%, poultry 2%, corn 34%, oats, 20%, wheat 1%, hay 13%, pasture 10%, equipment (debit Equipment Expense) 1%, miscellaneous elements, as barn yard, etc. (debit General Expense), 2%.

4. Calculate, and enter interest on investment for the year as follows:

(a) Debit Equipment Expense account and credit Interest on Investment with 4% of the value of equipment on hand at the beginning of the year.

(b) Debit each of the several livestock accounts and credit Interest on Investment with 4% of the value of each of the several classes of livestock on hand at the beginning of the year, except as modified in the following note:

Note.—Since all sheep were sold during the latter part of May, they should be charged (and Interest on Investment credited) with only five-twelfths of the interest on \$150 for a year.

5. Calculate and enter depreciation on equipment for the year, debiting Equipment Expense and crediting Equipment with 10% of the book value of equipment at the beginning of the year.

6. Post all the entries made under instructions 3, 4 and 5 above.

7. Charge out the feed consumed by livestock during the year by making a journal entry for the values shown in the feed record, debiting the several livestock accounts and crediting the crop accounts. Post the items in the entry just made.

8. Use the labor record as a basis for a journal entry, debiting the several accounts indicated therein and crediting Labor and Exchange Labor, each with the proper amount.

9. Use the horse labor record as a basis for a journal entry, debiting the several accounts indicated therein and crediting Horses and Exchange Labor, each with the proper amount.

10. Post the entries made under instructions 8 and 9 above.

11. (a) Distribute the balance of Equipment Expense account over the various farm elements on a basis of horse labor. This distribution is to be made as described under "Equipment Expense" and as shown in Illustration 53. In making these calculations, the hours shown in parentheses in the horse labor record are to be used. For example, if Illustration 47 contained

figures for the horse labor record in question, the Equipment Expense account balance would be divided by 2681. Assume that this division gave a result of .053, meaning that 5 cents to the nearest integral cent was to be charged for every hour the equipment was in use. The amounts to charge to the various accounts would be: cattle, 798 times .05; Field No. 1, 284 times .05; Exchange Labor 157 times .05 and so on.

(b) Make a journal entry expressing debits to the various accounts shown in the horse labor record and crediting Equipment Expense and Exchange Labor accounts with the amounts obtained in (a) above. Post the entry. (Since there is no inventory of Miscellaneous Supplies, in this problem, to affect Equipment Expense, the latter account would now be in balance with no inventory to carry down, if it were not for the fact that the fractional part of a cent was disregarded in the hourly rate.)

12. Make entries in the cash journal, closing any balances remaining in Labor, Exchange Labor and Equipment Expense accounts into General Expense account. Post the entry.

13. The inventory of mill feed is \$15. Record this in the account. Any balance left represents shrinkage or error in recording feed, and is to be transferred to General Expense account by entry in the cash journal. Post the entry, rule off the Mill Feed account and bring down the inventory.

14. Close Interest account into General Expense. Distribute the general expenses over the various productive elements by journal entry, crediting General Expense account with enough to close it and debiting each of the accounts representing productive elements with its fair share. For the purpose of securing uniformity charge the productive elements with the following proportions of the total: Cattle 5%, hogs 7%, poultry 3%, sheep 2%, oats 25%, hay 17%, corn 40%, wheat 1%. Post the entry.

15. Make entries direct in the accounts for the following inventories: household furnishings \$500; horses, \$1100; cattle, \$570; hogs, \$240; poultry, \$25; corn, \$830; oats, \$350; hay, \$290.

Transfer any balances remaining in the productive, Household

and Horses accounts into Loss and Gain account, carrying the inventories down below the ruling.

16. Close any other accounts showing a gain or loss into the Loss and Gain account. Pasture and Interest on Investment are examples.

17. Close Loss and Gain account into L. E. Fay's Capital account, ruling off the latter and bringing down the balance.

18. Rule off and bring down the balance of Cash account, and of any other property or liability accounts not specifically treated above.

INSTRUCTIONS AFTER CLOSING

(a) Take a trial balance after closing which may be considered also as a Statement of Resources and Liabilities as of December 31, 1916.

(b) Prepare a Farm and Individual Income Statement for the year.

(c) Prepare a Change of Wealth Statement as of December 31, 1916.

2. You are to record in the cash journal (beginning on a new page) the transactions of L. E. Fay for the year ended Dec. 31, 1917, which were as follows:

Jan. 3. Gave two promissory notes to landlord for \$250 each in payment of year's rent, one due Sept. 1 and one Dec. 15, 1917, without interest. (Debit Rent account.)

Jan. 3. Paid Roy Wade cash to balance account.

Jan. 4. Sold some corn for \$400 cash.

Jan. 15. Paid \$20 for clothing.

Jan. 30. Butchered a beef for family use, \$70.

Jan. 31. Took savings bank pass book to bank and had interest credited for the six months to Jan. 1st. \$7.50. (Debit State Trust & Savings Bank and credit Interest.)

Feb. 1. Paid interest on mortgage for six months, \$60.

Feb. 3. Sold beef quarter and other parts of the animal butchered a few days ago for \$30.

Mar. 1. Sold hogs for \$100 cash.

Mar. 1. Paid personal taxes, \$39.

Mar. 20. Paid for sundry household supplies, \$28.

Mar. 31. The household record shows the following commodities turned over to the house during January, February and March: poultry, \$4; eggs, \$9.20; milk, \$22.

Mar. 31. During the three months, the household has sold for cash part of the products as follows: eggs, \$4; butter, \$5.

Apr. 1. Made a contract with Roy Wade similar to the one of last year, except that he begins April 1 instead of May 1, and is to receive \$35 a month and his board, room and laundry, and the use of a horse and buggy.¹

Apr. 1. Sold some hay for \$150 cash.

Apr. 3. Bought mill feed for \$30.

Apr. 18. Paid for harness repairs, \$4. (Harness is part of the equipment.)

Apr. 28. Paid horseshoeing bill of \$2.

Apr. 30. Credited Roy Wade with wages for April \$35.

Apr. 30. The household values the board of hired man at \$20 for the month of April.

Note.—On the last day of each month from May to November, both inclusive, you are to make entries for the \$35 wages credited to Roy Wade and for the \$20 board without being told to do so each time.

May 8. Paid Roy Wade \$5 on account.

May 10. Paid for sundry repairs to equipment, \$8.

June 20. Paid cash for extra labor \$6.

June 25. Paid Roy Wade \$7 on account.

June 30. The household record shows the following commodities turned over to the house during April, May and June: poultry, \$6; eggs, \$18; milk, \$35.

June 30. During the three months, the household has sold for cash, part of the products as follows: eggs, \$10; butter, \$15.

July 1. Paid Roy Wade on account \$10.

¹ Theoretically, the value placed on the use of the horse and buggy would be debited to Labor and credited to Miscellaneous Income or to General Expense because this concession is equivalent to a recognition that labor is worth more than \$35 plus \$20 board. Mr. Fay, however, does not wish to consider the value of labor as increased by this concession.

July 4. Sundry expenses over the holiday amounted to \$3.10.

July 5. Paid cash for binder twine for 20 acres of wheat and 30 acres of oats \$25. (Divide the charge between the two accounts on a basis of acreage.)

July 18. Paid for extra labor, \$7.50.

July 20. Paid Roy Wade on account \$8.

July 21. Bought sundry household supplies for cash \$11.

July 21. Had interest for 6 months entered in savings bank pass book, \$7.50.

Aug. 1. Sold hay for \$160 cash.

Aug. 1. Withdrew all of savings account balance, and paid interest on mortgage \$60, and \$500 in reduction of the principal of the mortgage note.

Aug. 1. Paid Roy Wade on account \$9.

Aug. 8. Paid for new small pieces of equipment, \$12.

Aug. 10. Sold some wheat to D. C. Robbins for \$500, receiving a 60-day note bearing 6% interest.

Aug. 20. Sold some oats for \$450 cash.

Aug. 30. Bought supplies for household, \$15.

Aug. 31. Paid Roy Wade \$8 on account.

Sept. 1. Paid cash for extra labor \$10.

Sept. 1. Paid \$250 to redeem note held by landlord, due to-day.

Sept. 8. Sold two calves for \$50 cash.

Sept. 18. Paid Roy Wade \$12 on account.

Sept. 21. Paid fire insurance premiums, \$12.

Sept. 30. The household record shows the following commodities turned over to the house during July, August and September: poultry, \$4; eggs, \$16.30; milk, \$27.

Sept. 30. During the three months, the household has sold for cash, part of the products as follows: eggs, \$9; butter, \$12.

Oct. 19. Received a check from D. C. Robbins to redeem his note of August 10, with interest, \$505.

Oct. 19. Paid \$100 for Liberty Bonds (Dr. Liberty Bond account).

Oct. 26. Paid Roy Wade \$20 on account.

Oct. 31. Sold some shotes for \$300 cash.

Nov. 6. Bought sundry household supplies, \$15.

Nov. 15. Sold poultry for \$18 cash.

Nov. 16. Donated \$25 to Red Cross work. (General Expense).

Dec. 1. Sold 400 bu. corn at \$1.20 for cash.

Dec. 2. Bought a half interest¹ in a self-feed corn sheller for \$42.50 cash.

Dec. 15. Paid \$250 to redeem note held by landlord due to-day.

Dec. 20. Paid Roy Wade cash to balance his account.

Dec. 20. Paid \$30 cash for household supplies.

Dec. 31. The household record shows the following commodities turned over to the house during October, November and December: poultry, \$10; eggs, \$12; milk, \$30.

Dec. 31. During the three months, the household has sold for cash part of the products as follows: eggs, \$3; butter, \$13.

Dec. 31. Mr. Fay places the value of his services as a laborer at \$600 for the year.

The feed records kept during the year, when summarized into the Feed Record for the year ended Dec. 31, 1917, give the following Total Values:² Charges to Animals: Horses, \$574.90; Cattle, \$250.10; Hogs, \$400.30; Poultry, \$30. Credits to Crops and Feed: Corn, \$600.50; Hay, \$310; Oats, \$157.80; Wheat, \$87; Pasture, \$58; Mill Feed, \$42. (See closing instruction 7 at the end of the problem.)

The monthly labor records have been summarized into the Yearly Labor Record for the year ended Dec. 31, 1917, giving the total hours chargeable against the various accounts as follows: Cattle, 480; hogs, 245; horses, 212; general expense, 290; equipment expense, 164; poultry, 130; household, 190; corn, 1050, of which 1010 hours were worked by regular help and

¹ This requires a debit to Equipment account for only \$42.50. If the comparative inventory record were in use, the machine would be entered as a matter of record, with proper notation to indicate the other half-owner.

² The total values for the year are given, instead of requiring the student to compile the summarized table. These totals, however, have been determined in the same way as the totals obtained by the student in problem 1 above.

40 hours by the neighbors; oats, 280, of which 100 hours were worked by regular help and 180 hours by the neighbors; wheat 217, of which 82 hours were worked by regular help and 135 hours by the neighbors; hay 165; exchange labor 310. (The hours given above are to be figured at \$0.20 an hour as in closing instruction 8 referred to at the close of this problem.)

The monthly horse labor records have been summarized into the Yearly Horse Labor Record for the year ended Dec. 31, 1917, giving the total hours chargeable against various accounts as follows: Cattle, 20; hogs, 33; general expense, 78; equipment expense, 19; poultry, 13; household, 132; corn, 2080; oats, 604, of which 396 hours were worked by regular help and 208 hours by the neighbors; wheat, 435, of which 295 hours were worked by regular help and 140 hours by the neighbors; hay, 248; exchange labor, 330. (The hours given above are to be figured at \$0.10 an hour as in closing instruction 9 referred to below.)

INSTRUCTIONS FOR CLOSING

(See also Instructions for Closing at the end of Problem 1, Fay's 1916 accounts.)

1. Post all entries from the cash journal to the ledger before framing journal entries for the feed, labor and horse labor distributions.

2. Take a trial balance to test the accuracy of the work before closing.

3. Make a journal entry debiting the elements named below and crediting Rent, to distribute the \$500 rent over the several farm elements on a basis of the following percentages: Household 3%, cattle 4%, hogs 5%, horses 4%, poultry 2%, corn 32%, oats 15%, wheat 10%, hay 12%, pasture 10%, equipment 1%, miscellaneous elements (debit General Expense) 2%.

4. Calculate and enter interest on investment for the year, considering 4% on the equipment and on each class of livestock.

5. Make an entry for equipment depreciation during the year calculated at 10% diminishing value method. (Debit Equipment Expense, credit Equipment.)

6. Post all entries made under instructions 3, 4 and 5 above.

7. Make an entry for the value of commodities fed to live-stock during the year, using the results stated previously in this problem. Post the items in the entry just made.

8. Use the results given for the Year's Labor Record as a basis for a journal entry, being careful to use both the debit and credit exchange labor items correctly, as in problem 1, Mr. Fay's 1916 accounts.

9. Make a journal entry from the results of the Yearly Horse Labor Record, using Mr. Fay's 1916 accounts in problem 1 as a guide if necessary.

10. Post the entries made under instructions 8 and 9 above.

11. Make an entry distributing the balance of Equipment Expense over the various farm elements following the suggestions given in instructions 11 (a) and 11 (b) in the 1916 accounts of L. E. Fay. Post the entry.

12. Make entries to close Labor, Exchange Labor and Equipment Expense accounts. Post.

13. There is no inventory of Mill Feed. Make a journal entry to close the account into General Expense account. Post the entry and rule off the Mill Feed account.

14. Close Interest account into General Expense. Distribute the General Expense balance over the various productive elements by journal entry according to the following proportions: cattle 5%, hogs 7%, poultry 3%, oats 20%, hay 15%, corn 35%, wheat 15%. Post the entry.

15. Make entries direct in the accounts for the following inventories: household furnishings, \$500; horses, \$1200; cattle, \$600; hogs, \$300; poultry, \$30; wheat, \$200; oats, \$300; corn, \$1250; hay, \$330.

Transfer any balances remaining in the productive, Household and Horses accounts into Loss and Gain account, carrying the inventories down below the ruling.

16. Close any other accounts showing a gain or loss into the Loss and Gain account. Pasture and Interest on Investment are examples.

17. Close Loss and Gain account into L. E. Fay's Capital account, ruling off the latter and bringing down the balance.

18. Rule off and bring down the balance of Cash account and of any other property or liability accounts not specifically treated above.

INSTRUCTIONS AFTER CLOSING

(a) Take a trial balance after closing which may be considered also as a Statement of Resources and Liabilities as of December 31, 1917.

(b) Prepare a Farm and Individual Income Statement for the year.

(c) Prepare a Change of Wealth Statement as of December 31, 1917.

COMPARATIVE STUDY OF PROBLEMS

After completing the statements of the business of L. E. Fay under the cost system, a comparative study is to be made of the results obtained under the cost method and under the general method. This is effected principally through a study of the ledger accounts of problems 3 and 4 of Chapter VII, together with the accounts of problems 1 and 2 of Chapters VIII and IX.

This comparative study is a most important step towards the understanding of farm cost accounting. It was considered of sufficient importance to warrant the repetition of L. E. Fay's general transactions in the two sets of problems.

Considerable time should be spent in class discussion led by the instructor. It should be understood that the comparison is between the two year period under the cost and general methods, and not between 1916 and 1917 under the same method. The discussion should aim to present and answer the following questions:

(a) Were the transactions between the farm and outside parties the same under the two methods?

(b) Is the net gain for 1916 the same under both methods? the net gain for 1917?

(c) Why is there no difference, under the general and cost methods, in the following accounts: B. E. Adams, Notes Receivable, Equipment, Cash, Roy Wade, Watt Hardware Co., State Trust and Savings Bank, Mortgage Payable, Notes Payable?

(d) In what detailed respects and why are the following accounts different under the two methods: Loss and Gain, Interest on Investment, Interest, Horses, Cattle, Hogs, Sheep, Poultry, Mill Feed, Corn, Oats, Wheat, Hay, Equipment Expense, General Expense, Labor, Pasture, Exchange Labor, and Household?

(e) Why is the trial balance after closing the same under the two methods?

(f) In comparing the Farm and Individual Income Statements and the Change of Wealth Statements under the two methods, how do you account for any differences and similarities found therein?

(g) In general how may the fundamental differences in the results under the two systems be summarized?

(h) Which method do you think is the better? Why?

(i) In view of the study made of L. E. Fay's productive accounts under the two methods, what can you say as to the meanings attached to the words "gain" and "loss"?

Note.—It is the aim in the several succeeding problems to concentrate more on the principles arising in cost accounting and the closing process, and less on the recording of the more simple entries which must always arise in the course of a year's operations. The problems which follow are adopted from the accounts of an Illinois farmer, but modified for the purpose of illustrating the treatment of various principles in cost accounting.

The detailed transactions with outsiders and with the Household are stated in aggregate form except in the case of unusual transactions. For example, a transaction showing the cash purchase of \$310 worth of supplies for the household is stated near the close of the year. This means that, as a matter of fact, the farmer in question made a number of small purchases throughout the year, each of which caused a debit to Household and a credit to Cash. Similar examples in the reduction of the number of entries might be cited for General Expense items, Labor items, products consumed by the household, and other simple transactions in which sufficient drill has been given in problems of the preceding chapters.

Although in practice the Comparative Inventory Record is kept with a cost system in the same way as under the general accounting system, its use is not required in these cost problems.

The details are reduced somewhat, also, by the method of presenting data from the feed, labor and horse labor records. The aggregate amounts for the year are stated in the problems. The figures so stated, it should be noted, are taken from the monthly feed, labor and horse labor records, which the student is not required to prepare in regular form for the purpose of these problems.

With the simplifications noted above, there is little use for many special columns in the cash journal. Accordingly it is reduced to the simplest type.

All notations as to quantities and prices used in connection with fields, crops and livestock are to be carried into the ledger accounts for use in the problems of Chapter X.

3. (Work on this problem should not be started until after reading carefully the Note above.)

Mr. C. P. May rents a farm of 270 acres on a cash basis for \$1350 a year, from W. E. Reed. You are to keep the accounts of his operations on a cost basis from the beginning of the fiscal year Mar. 1, 1915.

The farm plot at that time shows that the farm is divided into the following areas:

Field No. 1.....	20 acres
Field No. 2.....	40 acres
Field No. 3.....	60 acres
Field No. 4.....	40 acres
Field No. 5.....	40 acres
Field No. 5a.....	40 acres
Field No. 6 (Pasture).....	20 acres
Hog Lot.....	2 acres
Garden and House Lot.....	2 acres
Orchard.....	2 acres
Barn Yard.....	4 acres
Total.....	<u>270 acres</u>

His resources and liabilities are ascertained by appraisal as follows:

LIST OF RESOURCES AND LIABILITIES, MAR. 1, 1915. C. P. MAY

<i>Resources</i>	<i>Liabilities</i>
Cash..... \$191	Notes Payable:
Horses (10)..... 1,240	To W. E. Reed \$1,350
Cattle (14)..... 500	To J. L. Mix 300 1,650
Swine (27)..... 400	<hr/>
Poultry (120)..... 60	C. P. May, Capital In-
Corn (580 bu.)..... 280	vestment..... \$4,526
Oats (420 bu.)..... 120	
Barley (180 bu.)..... 90	
Soy Beans (110 bu.).... 150	
Hay (Timothy, 18 tons) 130	
Straw (15 tons)..... 30	
Silage (75 tons)..... 300	
Seed (Oats, 80 bu. @ 35c; wheat, 80 bu. @ 65c).. 80	
Equipment..... 680	
1915 Rent..... 1,350	
Field No. 1 (Rent \$90; Labor \$5)..... 95	
Field No. 3 (Seed)..... 40	
Field No. 4 (Labor \$10; Horse L. \$10)..... 20	
Field No. 5 (Labor \$10; Horse L. \$10)..... 20	
Household Furnishings.. 400	
<hr/> \$6,176	<hr/> \$6,176
<hr/>	<hr/>

Make an entry in the cash journal to open the books. Accounts are to be kept for each item listed as resources and liabilities, except that Household Furnishings are to be debited to Household account; and only one Notes Payable account is to be used.

The 1915 Rent item is listed as a resource because it is a deferred debit to represent rent paid in advance. It was paid by a note or several notes, apparently, since the liability on Notes Payable shows one in favor of the landlord W. E. Reed for \$1350.

The amounts shown as resources opposite Fields Nos. 1, 3, 4 and 5 respectively represent an estimate of the amount of seed and labor spent on them in preparation for the crops of the coming season. The charge to Field No. 1 includes \$90 rent for 1914, when it lay fallow.

Subject to the comments in the Note preceding this problem, the transactions and operations for the year are stated below. They are to be entered in the cash journal.

Mar. 1. Distribute the rent over the several Field and other accounts affected on the following basis: Each Field and Pasture account with \$4.50 an acre; Swine with \$4.50 an acre plus \$5 for the building; Household with \$4.50 an acre for the areas occupied by the garden, house and orchard plus \$90 for the dwelling; General Expense with \$4.50 an acre for the barnyard; Horses with \$15; Cattle \$10; Poultry \$5; Equipment Expense \$5, and Corn \$5, each for buildings occupied by the properties indicated by the account titles.

Mar. 16. Sold 110 bushels soy beans at \$2 a bushel, cash.

Apr. 4. Sowed 80 bushels of oats selected as seed at \$1, in Field No. 4; also, in the same field, 8 bushels of red clover at \$9. (Since the clover seed was purchased just before sowing, credit cash and debit Field No. 4 for its value.)

Apr. 6. Sowed 80 bushels of wheat selected as seed at \$2 in Field No. 2.

Apr. 18. Sold 160 bushels of barley for \$112, cash.

May 1. Planted $4\frac{1}{2}$ bushels of corn (including wastage) at \$3.50 in Field No. 1. (This is an exception to the rule, in crediting Corn account at the price of seed.)

May 5. Planted 9 bushels of corn at \$3.50 in Field No. 5a.

July 1. Took 80 tons of timothy hay from Field No. 3. (Make notation of quantity only in explanation columns of Hay and Field No. 3 accounts.)

Aug. 1. Threshed the wheat from Field No. 2. It measured

1050 bushels. There was estimated to be 28 tons of straw, valued at \$3 a ton.

Note.—At this time make notations on the credit side of Field No. 2 account and debit side of Wheat account showing only the 1050 bushels without any values extended into the money columns. The values will be placed opposite these explanations at the end of the year when the cost of operating Field No. 2 has been determined. At this time make an entry in the cash journal, debiting Straw and crediting Wheat with \$84 for the straw produced.

Aug. 3. Paid \$65 for expenses in threshing wheat, including coal and binder twine.

Aug. 21. Threshed the oats from Field No. 4. They measured 1260 bushels. There was estimated to be 34 tons of straw valued at \$3.50 a ton.

Aug. 22. Paid \$66.30 for expenses in threshing oats, including coal and binder twine.

Sept. 1. Received check for \$525, for 500 bushels of wheat at \$0.85 and 250 bushels of oats at \$0.40.

Oct. 1. Used 10 acres of corn from Field No. 5a in silage. The yield was estimated by test at 45 bushels per acre and the market price was \$0.65 a bushel.

Note.—At this time make notations in the explanation columns on the debit side of Corn and credit of Field No. 5a account, showing the total estimated number of bushels used. Then make an entry in the cash journal debiting Silage and crediting Corn account with the total value of the corn used (\$292.50). Ninety tons of silage was produced.

Oct. 4. Paid \$25 for engine hire and coal in filling the silo.

Oct. 13. Received check for 60 tons timothy hay at \$9 a ton, hauling to be done by the purchaser.

Dec. 10. Corn husking has been finished. The 20 acres in Field No. 1 yielded 1180 bushels. The remaining 30 acres of Field No. 5a yielded 1370 bushels. (Make notations in the explanation columns only, at this time.)

Dec. 12. Sold apples and vegetables for \$45 cash (Cr. Household for both).

Dec. 15. Received a check for \$360 for 600 bu. of corn at \$0.60 a bushel.

Dec. 20. Signed a lease for another year under the same terms as the present one, giving two promissory notes, one for \$700 and one for \$650 due Sept. 1 and Jan. 1.

Feb. 10, 1916. Sold 300 bu. of wheat for \$270 cash.

Feb. 18. Sold 500 bu. of oats for \$220 cash.

Feb. 25. Sold 1400 bu. of corn for \$875 cash.

Feb. 29. Other transactions ordinarily entered from time to time as they arise, but summarized here for the purpose of reducing details to a minimum, resulted in the following aggregates: (The date Feb. 29, 1916, may be used for all of these transactions, since they were completed on a great number of different dates throughout the year.)

Paid cash for new equipment during the year, \$80.

Paid cash for sundry equipment repairs, \$25.60.

Paid \$60 for mill feed.

Paid \$57 for various expenses in connection with horses, as veterinary, service fees, shoeing, etc.

Paid \$185 for a mare.

Paid \$80 for one Angus bull.

Paid \$15 for various expenses in connection with cattle during the year.

Received \$30 cash from sale of poultry during the year.

Received \$170 as commission for selling silos. (Cr. Silo Commission Account.)

Paid \$10 for poultry feed. (This is charged direct to the Poultry at time of purchase, since it is not fed to any other animals. Accordingly, the feed record does not contain any reference to the feeding of this special feed.)

Paid \$45 for extra labor during the year. (This requires a debit to Labor at time of payment. The value of the work of the extra help is distributed over the farm elements from the labor record, the same as for regular help.)

Paid \$1350 to W. E. Reed to redeem notes without interest.

Paid \$307.50 to J. L. Mix to redeem note with interest. (Dr. General Expense for the interest.)

Paid \$310 for household supplies, furnishings, clothing, and

incidentals during the year, including insurance and taxes on household property.

Paid \$40 for general expenses during the year, including insurance and taxes on farm property.

Paid \$580 cash for regular labor during the year.

The household supplied the hired help with board and lodging valued at \$390 during the year.

The Household was charged during the year with the following commodities: eggs produced, 300 dozen at an average farm value of \$0.24 a dozen; milk produced, 12,700 pounds at \$1.50 a cwt.; poultry consumed valued at \$15, pigs butchered valued at \$50. (The garden cost is charged to the Household through the labor records.)

Practically all of the manure was hauled away from the barnyard during the year. It was valued at \$20. Of this amount horses are to be credited with \$14 and cattle with \$6. It was all applied to Field No. 3.

Sales of eggs for cash during the year were \$39.20, being 140 dozen at an average price of \$0.28 a dozen. (The Household was charged with all eggs gathered.)

Sales of butter for cash amounted to \$234, being 780 lbs. at \$0.30. (The Household was charged with all milk produced.)

Sold two calves for \$58 cash.

The household supplied 6500 pounds of skim milk for the chickens, pigs and calves during the year, at 15c per cwt. as follows: chickens, 500 lbs.; pigs, 5000 lbs.; and calves 1000 lbs.

The proprietor valued his services as a laborer at \$600 for the year. The time of his wife spent in caring for poultry is estimated at \$45. (This is not recorded in Labor record, hence is charged now to Poultry account.)

Sorted out 15 bushels of corn for seed, the market value of which was \$0.63 a bushel.

The feed record for the year showed the following values to be expressed as debits and credits: Debits to livestock: horses, \$490; cattle, \$470; swine, \$560; poultry, \$28. Credits to crop and feed accounts: Corn, 981 bu. at 62c, \$608.22; oats, 450 bu. at 42c, \$189; barley, 15 bu. at 65c, \$9.75; hay, 15 tons at \$8.75, \$131.25; wheat, 50 bu. at 85c, \$42.50; silage, 80 tons at \$4,

\$320; mill feed including salt, \$47.28; Field No. 6 (Pasture), 3500 days at 5c, \$175; by-products, 500 days at 5c, \$25.

Straw used for bedding was valued at \$20, being 3 tons used for cattle and 7 tons for horses, each calculated at \$2 a ton.

The labor record for the year showed the following hours spent on each farm element: cattle, 710; horses, 500; swine, 420; poultry, 20; corn, 480; oats, 370, of which 160 hours were worked by neighbors; wheat, 405, of which 180 hours were worked by neighbors; barley, 30; soy beans, 20; hay, 580, of which 60 hours were worked by neighbors; mill feed, 8; silage, 380, of which 40 hours were worked by neighbors; Field No. 1, 325; Field No. 2, 240; Field No. 3, 15; Field No. 4, 205; Field No. 5a, 590; seed, 7; exchange labor (for neighbors), 455; household (including time spent by laborers and proprietor on garden and orchard), 270; silo agency (Dr. Silo Commission account), 110; Equipment Expense, 130; General Expense, 435; Field No. 2-1916, 85; Field No. 3-1916, 130.

Note: Make a separate entry for the Field No. 2-1916, and Field No. 3-1916, labor. In posting, however, post to Field No. 2 and Field No. 3 accounts, respectively, and indicate in the ledger explanation columns that they are for 1916. They will then be considered as inventories to carry down at the close of the year.

The horse labor record for the year showed the following hours spent on each farm element: cattle, 105; swine, 80; corn, 900; oats, 260, of which 100 hours were by neighbors' horses; wheat, 325, of which 120 hours were by neighbors' horses; barley, 35; soy beans, 25; hay, 490; mill feed, 15; silage, 240; Field No. 1, 900; Field No. 2, 535; Field No. 3, 10; Field No. 4, 575; Field No. 5a, 1455; exchange labor (for neighbors), 230; household, 200; silo agency, 40; equipment expense, 20; general expense, 290; Field No. 2-1916, 255; Field No. 3-1916, 390.

INSTRUCTIONS FOR CLOSING

1. Make entries in the cash journal for all transactions up to but exclusive of those for the feed record.

2. Post all entries made, leaving a full page for each account, to take care of items in two succeeding years.

3. Take a trial balance.

4. Calculate and make an entry in the cash journal for interest on investment for the year. This implies 4 per cent. on the value of each class of livestock and on equipment as at the beginning of the year. Post the entry.

5. Make an entry for depreciation of equipment at 10 per cent. for the year. Post the entry.

6. Make an entry in the cash journal to express debits and credits for feed and bedding consumed by livestock. Post the entry.

7. Place the labor and horse labor hours in order for further calculations. This may be done in the place ordinarily reserved for these records in some such form as this:

Labor Summary

	Hours	Value
Cattle.....	710	
Horses.....	500	
etc.		
Oats.....	{ (160)	
	210	
etc.....		
	_____	_____
Total.....	{ (440)	
	6480	

Horse Labor Summary

	Hours	Value	Value of Equip. Exp.
Cattle.....	105		
Swine.....	80		
etc.			
	_____	_____	_____
Total.....	{ (220)		
	7,155		

8. Calculate the hourly cost of labor. This is done by dividing the total cost of labor for the year by 6480, the number of

hours worked by the men whose time was charged to Labor account. Use the hourly rate only to the nearest cent. For example, a result of 21.6 cents would be used as 22 cents.

Using the hourly rate just determined and with the assistance of the Labor Conversion Table of Illustration 75, Appendix, calculate the value of labor, for each farm element. Record the amounts, for convenience on the paper as described under instruction 7, above.

Note.—The values calculated for the various farm elements are self proving to a certain extent. After finding that the value of labor spent on horses is \$177.50 and so on, the sum of all the values not in parentheses should equal the total hours, 6480, multiplied by the hourly rate. Likewise the total of the values in parentheses (work by neighbors) should equal the total hours in parentheses, 440, multiplied by the hourly rate.

9. Make a journal entry debiting the various elements with the value of labor calculated in 8 above, and crediting Labor and Exchange Labor accounts each with the proper amounts. Post the entry.

10. Calculate the hourly cost of horse labor. This is done by dividing the net cost of keeping horses by 7155, the total hours worked by the horses for which the expense was incurred. (The cost of keeping horses includes the charges for rent, sundry cash expenses, interest on investment, bedding, feed and labor; with a deduction made for manure. It does not include the inventory value of horses on hand at the beginning nor the cost of any purchased during the year.)

Using the hourly rate just determined, calculate the value of horse labor for each farm element. Record the amounts, for convenience, on the paper as described under instruction 7, above.

11. Make a journal entry debiting the various elements with the value of horse labor calculated in 10 above, and crediting Horses and Exchange Labor accounts each with the proper amounts. Post the entry.

12. Find the net charge to Equipment Expense account for the year. (Supplies of axle grease, machine oil and other supplies are too small to consider for inventory purposes.) Divide this amount by 7155, the hours worked by the farm horses. This

result gives the approximate cost of maintaining the equipment for each hour of its use.

Using the hourly rate to the nearest cent,¹ as just determined, proceed to make an entry debiting the various farm elements for the use of the equipment, based on the number of hours it was used on each element, crediting Equipment Expense and Exchange Labor accounts. (This process will be accomplished best by using the third column shown under Horse Labor Summary under instruction 7 above before framing the journal entry. This method takes the place of the one described under "Equipment Expense" and shown in Illustration 53.) (See also instruction 11, problem 1, Chapters VIII and IX.) Post the entry.

13. Calculate and enter the inventories of fertilizer, labor, horse labor and other charges to field accounts, which are to be carried over to next year's operations.

In field No. 1 consider that the corn crop of the year just closing, received 40 per cent. of the benefit of the soil from its lying fallow the year before. This means that 60 per cent. of \$90 (the rent for the year 1914), or \$54, is to be carried down as an inventory. All of the 1915 rent remains as a charge to the operations of the current year.

In fields No. 2 and No. 3 the inventories consist in each case of the three items noted in the explanation column of the ledger as Labor-1916, Horse Labor-1916 and Equipment use-1916. These should be shown as separate items both above and below the rulings. All of the manure applied on field No. 3 during the year is carried over as a deferred charge, since it was applied after harvesting the crop of the current year.

The clover seed of field No. 4 is considered as an inventory or deferred charge. No labor is carried over for this, for it was sown with the oats.

Since there were no transactions with field No. 5 after opening the books on March 1, 1915, all of the debit balance is to be treated as an inventory. By leaving the account exactly as

¹ Dropping the fractional part of a cent results in a distribution of Equipment Expense amounting to about \$15 or \$20 less than the balance of the account. This difference is distributed later through General Expense account. See instruction 14 below.

it is, the next year's operations are charged with the cost of permitting the field to lie fallow. At the close of the next year, part of this expense will be carried over to subsequent years, to show the benefit they derive from having it lie fallow during the current year.

After recording the inventories as outlined above, the resulting balance of each of the field accounts on which crops were raised during the year shows the cost of producing such crops. This cost is now transferred to the Crop accounts by making entries in the money columns only, debiting the several crop accounts and crediting the respective field accounts. Notations have already been made in the explanation columns at the time of harvest. The unit cost should now be recorded in the explanation column also. (See Illustration 52.) Bring the inventories of fields down below the rulings.

14. Transfer to General Expense account by journal entry any balance (presumably quite small) remaining in Mill Feed account after entering and bringing down an inventory of \$10.

Also transfer the balances of Equipment Expense, Labor, and Exchange Labor into General Expense account, by journal entry. Post the entries, and rule off the accounts closed.

15. Distribute by journal entry the general expenses over the productive elements, using the following percentages for the purpose of obtaining uniformity: cattle 20%, swine 15%, poultry 1%, corn 15%, oats 12%, wheat 15%, barley 1%, soy beans 1%, hay 20%. Post the entry, ruling off the General Expense account.

16. Make entries for the following inventories of livestock and commodities on hand at the close of the year, transferring by journal entry to Loss and Gain account the balances of all accounts open on the books that show either a loss or gain. Post the entries, making sure that all necessary accounts are ruled off and balances or inventories brought down. Inventories Feb. 29, 1916: Horses (13), \$1625; cattle (16), \$575; swine (50), \$930; poultry (110), \$55; corn, 100 bu. at 38c (cost), \$38; oats, 450 bu. at 49c (cost), \$220.50; wheat, 190 bu. at 67c (cost), \$127.30; barley, none on hand; hay, 23 tons at \$7.10 (cost), \$163.30; straw, 65 tons at \$3 (book value), \$195; silage, 85

tons at \$4.95 (cost), \$421.30; seed, 15 bu. corn at 63c, plus cost of sorting (\$1.75), a total of \$11.20, being nearly 75c per bushel; household furnishings, \$400.

Note.—Do not neglect to bring down balances in the Cash and Equipment accounts; nor to close, among others, the balances of Soy Beans, Barley, Field No. 6 (Pasture), Silo Commission, Interest on Investment and By-products into Loss and Gain account. The 1916 Rent account is a deferred debit to be considered as a resource.

INSTRUCTIONS AFTER CLOSING

(a) Take a trial balance which will serve also as a Statement of Resources and Liabilities.

(b) Study the accounts. What do they tell you about the year's operations?

(c) Preserve all books, accounts and records for use in the two problems following which are continuations of this one; and for use in the problems of Chapter X which call for further analysis of these accounts.

4. You are to keep the books for C. P. May for the year ended Feb. 28, 1917, following the same general principles used in the preceding year as in problem 3 above.

Mar. 1, 1916. Distribute the rent over the several Field and other accounts affected on the same basis as at the beginning of the preceding year. (See problem 3 above.)

Apr. 6. Sowed 105 bu. of oats at 50c a bushel in field No. 3; also, in the same field, 12 bushels of red clover at \$9. (The clover seed was purchased for cash at time of sowing.)

Apr. 8. Sowed 70 bushels of wheat at 90c a bushel in field No. 2.

May 2. Planted 4 bushels of seed corn at \$3.40 in field No. 1.

May 6. Planted $7\frac{1}{2}$ bushels of seed corn at \$3.40 in field No. 5.

June 4. Paid for 42 bushels of medium yellow soy beans at \$2.25, and planted them in field No. 5a.

July 10. Took 70 tons of clover hay from field No. 4.

Aug. 10. Threshed the wheat from field No. 2. It measured 960 bushels. There was estimated to be 25 tons of straw valued at \$3 a ton.

Aug. 10. Paid \$57 for threshing expenses in connection with wheat.

Aug. 20. Threshed the oats from field No. 3. They measured 2220 bushels. There was estimated to be 54 tons of straw at \$3 a ton.

Aug. 20. Paid \$73 expenses for threshing oats.

Oct. 8. Used 10 acres of corn from field No. 1 in silage. The yield was estimated by test at 50 bushels per acre, and the market price was 70c a bushel. Ninety-five tons of silage were produced. (See similar transaction in problem 3.)

Oct. 15. Paid \$26 for engine hire and coal in filling the silo.

Oct. 15. Harvested 640 bu. soy beans from field No. 5a; also $\frac{3}{4}$ ton of soy bean hay valued at \$16 a ton and 22 tons of soy bean straw valued at \$3 a ton. (Enter as in case of wheat straw, debiting Hay and Straw accounts.)

Oct. 17. Sold all of the soy bean hay and soy bean straw for cash, at the prices used in the valuation at time of harvest.

Dec. 2. Corn husking resulted in the following memorandum report being submitted for entry: The remaining 10 acres of field No. 1 yielded 530 bushels. The 40 acres of field No. 5 yielded 2520 bushels.

Feb. 28, 1917. Other transactions of the year, ordinarily entered from time to time as they arise, but summarized here for the purpose of reducing details to a minimum, resulted in the following aggregates:

Sold 5250 lbs. of hogs (30) at \$10 per cwt. for cash.

Sold 20,000 pounds of milk direct to the creamery and received \$350 cash. (When sold direct to the creamery do not consider it as passing through the household. The latter is debited only for what it uses under such conditions.)

Sold 300 bushels of soy beans at \$2.50 cash.

Sold 800 bushels of wheat at \$1.40 cash.

Sold 1800 bushels of oats at 50c cash.

Sold 1700 bushels of corn at \$1 cash.

Paid \$1350 to redeem the two notes held by landlord.

The Household was charged with the following commodities: eggs produced, 310 dozen, at an average farm value of 25 cents a dozen; milk consumed, 3000 lbs., at \$1.60 per cwt.; poultry consumed, \$16; pigs butchered, \$55.

Sales of eggs for cash during the year amounted to \$49.30, being 170 dozen at an average price of 29c a dozen.

The household received \$55 from the sale of fruit and vegetables during the year.

Paid cash for new equipment during the year, \$20.

Paid \$30 for equipment repairs, oil, etc.

Sundry expenses paid for horses amounted to \$45.

Sold two colts for \$280 cash.

Paid \$25 for various expenses in connection with cattle.

Received \$35 from sale of poultry during the year.

Commission for selling silos, amounting to \$120, was received in cash.

Paid \$15 for special poultry feed.

Paid \$25 for extra labor during the year.

Paid \$405 for household supplies, furnishings, clothing and incidentals.

General Expenses paid in cash amounted to \$32.

Paid \$550 for regular labor during the year.

The household supplied the hired help with board and lodging valued at \$370.

Manure hauled to field No. 5 was valued at \$20, of which \$14 is to be credited to horses and \$6 to cattle.

An old straw stack was spread over field No. 1, value \$20, estimated at ten tons.

Sold two calves for \$46 cash.

The proprietor valued his services as a laborer at \$600 for the year. The time spent by his wife in caring for poultry was valued at \$45.

Sorted out 15 bushels of corn for seed, the market value of which was \$1 a bushel.

Straw used for bedding was valued at \$34.50, being 3½ tons for cattle and 8 tons for horses, each calculated at \$3 a ton.

The feed record for the year showed the following values, to

be expressed as debits and credits: Debits to livestock: horses, \$630; cattle, \$565; swine, \$586.70; poultry, \$26. Credits to crop and feed accounts: corn, 300 bu. at 95c, \$285; oats 720 bu. at 48c, \$345.60; hay 17 tons at \$9, \$153; wheat, 100 bu. at \$1.30, \$130; seed, $3\frac{1}{2}$ bu. of corn sorted but not planted, at 80c, \$2.80; silage, 85 tons at \$4.95,¹ \$421.30; mill feed, \$10, soy beans 100 bu. at \$2.50, \$250; field No. 6 (pasture), 3600 days at 5c, \$180; by-products, 600 days at 5c, \$30.

The labor record for the year showed the following hours spent on each farm element: Cattle, 730; horses, 510; swine, 460; poultry, 20; corn, 450; oats, 500, of which 190 hours were worked by neighbors; wheat, 390, of which 180 hours were worked by neighbors; soy beans, 330, of which 130 were worked by neighbors; hay, 390, of which 70 hours were worked by neighbors; silage, 400, of which 70 hours were worked by neighbors; field No. 1, 360; field No. 2, 120; field No. 3, 150; field No. 4, 10; field No. 5, 320; field No. 5a, 240; seed, 8; exchange labor (for neighbors), 620; household, 340; silo agency, 80; equipment expense, 140; general expense, 310; field No. 2-1917, 60; field No. 4-1917, 80.

The horse labor record for the year showed the following hours spent on each farm element: Cattle, 100; swine, 100; corn, 840; oats, 360, of which 130 hours were worked by neighbors' horses; wheat 320, of which 120 hours were worked by neighbors' horses; soy beans, 420, of which 170 hours were worked by neighbors' horses; hay, 330; silage, 240; field No. 1, 1000; field No. 2, 320; field No. 3, 400; field No. 4, 10; field No. 5, 950; field No. 5a, 700; exchange labor (for neighbors), 400; household, 300; silo agency, 30; equipment expense, 20; general expense, 260; field No. 2-1917, 240; field No. 4-1917, 260.

INSTRUCTIONS FOR CLOSING

1. Make entries in the cash journal for all transactions up to but exclusive of those for the feed record.

¹ Note that this is the quantity and value of silage on hand at the beginning of the year, which, being shown at cost, amounted to slightly more than \$4.95 per ton.

2. Post all entries made, being sure to show details in explanation columns of the field and productive accounts for later analysis.

3. Take a trial balance.

4. Calculate and make an entry in the cash journal for interest on investment for the year. This implies 4% on the value of each class of livestock and on equipment as at the beginning of the year. Post the entry.

5. Make an entry for depreciation of equipment at 10% for the year. Post the entry.

6. Make an entry in the cash journal to express debits and credits for feed consumed by livestock. Post the entry.

7. Place the labor and horse labor hours in order for further calculations. This may be done as shown under instruction 7, problem 3.

8. Calculate the hourly cost of labor. Using the hourly rate just determined, and with the assistance of the Labor Conversion Table, Illustration 75, Appendix, calculate the value of labor for each farm element. Record the amounts, for convenience, on the paper as described under instruction 7, problem 3.

9. Make a journal entry for the value of labor calculated in instruction 8. Post the entry.

10. Calculate the hourly cost of horse labor. Using the hourly rate just determined, calculate the value of horse labor for each farm element. Record the amounts, for convenience, on the paper as described under instruction 7, problem 3.

11. Make a journal entry for the value of horse labor calculated in instruction 10. Post the entry.

12. Calculate the cost per hour of maintaining equipment during the year, as explained under instruction 12, problem 3.

Using the hourly equipment rate as just determined, make an entry as described under instruction 12, problem 3, to distribute the expense over the various farm elements. Post the entry.

13. Calculate and enter the inventories or deferred charges to field accounts which are to be carried over to next year's operations.

In Field No. 1 consider that 30% of the original \$90 rent from 1914 was absorbed by the crop of the current year and that the straw manure was applied after harvesting in the current year.

In Field No. 3, consider as absorbed during the year 40% of the manure applied in the preceding fall. This means that 60% or \$12 is to be carried down. All of the value of clover sown is treated as a deferred charge.

In Field No. 5, the \$180 rent during the year the land lay fallow, is to be distributed over the several succeeding years in the same way as an application of manure would be. The current year bears 40%, then, leaving 60% to carry down. The \$20 worth of manure was applied after harvesting the crop.

After crediting the inventories as suggested above, complete the entries in the several field and crop accounts to show the total and unit costs of producing the crops in the fields. Bring the inventories of fields down below the rulings.

14. Transfer the balances of Equipment Expense, Labor and Exchange Labor into General Expense account, ruling off the accounts closed.

15. Distribute by journal entry the general expenses over the productive elements, using the following percentages for the purpose of obtaining uniformity: cattle, 20%; swine, 15%; poultry, 1%; corn, 15%; oats, 15%; wheat, 12%; soy beans, 10%; hay, 12%. Post the entry.

16. Make entries for the following inventories of livestock and commodities on hand at the close of the year, transferring by journal entry to Loss and Gain account, the balances of all accounts open on the books that show either a loss or a gain. Post the entries, making sure that all necessary accounts are ruled off and balances or inventories brought down. Inventories Feb. 28, 1917: Horses (12), \$1500; cattle (17), \$610; swine (52), \$990; poultry (110), \$55; corn, 1100 bu. at 32c. (cost), \$352; oats, 40 bu. at 35c (cost), \$14.00; wheat, 175 bu. at 61c (cost), \$106.75; soy beans, 235 bu. at 92c (cost), \$216.20; hay 75 tons at \$6.07 (cost), \$455.25; straw, 120 tons at \$3, \$360;

silage, 95 tons at \$5.32 (cost), \$505.60; seed, 15 bu. corn at \$1, plus cost of sorting (\$1.92), a total of \$16.92, being nearly \$1.13 a bushel; household furnishings, \$400.

INSTRUCTIONS AFTER CLOSING

(a) Take a trial balance which will serve also as a Statement of Resources and Liabilities as of Feb. 28, 1917.

(b) Study the accounts carefully. Compare them with the corresponding ones of the preceding year. Scrutinize the Loss and Gain accounts of the two years together. Do the same with the two trial balances after closing.

(c) Preserve the books, accounts and records for use in the problem following, which is a continuation of Mr. May's business; and for the problems of Chapter X, which call for further analysis of these accounts.

5. You are to keep the books for the farming business of Mr. May for the third successive year Mar. 1, 1917, to Feb. 28, 1918, following the same general principles used in the two preceding years.

Mar. 1, 1917. Mr. May has completed negotiations for the purchase of 170 acres of the farm from W. E. Reed for \$21,700, being at the rate of \$110 an acre with an additional \$3000 for the improvements. The price includes all expenses in connection with the purchase.

In meeting the purchase price he pays \$3200 in cash, borrows \$10,000 on a 6% 20-year first mortgage note (interest payable annually) under the Federal Farm Loan Act, through a local National Farm Loan Association; and gives W. E. Reed a second 6% mortgage for \$8500 to run ten years with the privilege of paying off the principal in multiples of \$100 on any interest paying date. (A payment of \$87.18 each year for 20 years under the amortization plan at 6% is required in order to pay off the principal and interest when the principal is \$1000. When the principal is \$10,000, therefore, at the same rate for the same time, the annual payment is \$871.80.)

The entry for the purchase should express the following debits and credits:

Land (170 acres legal description stated)

Buildings

Cash

Mortgage Payable (6%—20 yrs. Federal)

Mortgage Payable (6%—10 yrs. W. E. Reed)

Not being able to finance the purchase of more than 170 acres, Mr. May did not buy the 100 acres of land designated by him as fields Nos. 5, 5a and 6. He divided field No. 3 into two parts, one of 20 acres to be reserved as a pasture and called field No. 3a, and one of 40 acres to be used for crops and called field No. 3b. The seller W. E. Reed has rented the other 100 acres to another man.

Mar. 1. Close Field No. 3 account by journal entry, and open accounts with Field No. 3a and Field No. 3b. This is accomplished by transferring one-third of the deferred charge to the former and two-thirds to the latter.

Mar. 1. Charge the several farm elements with interest on land and buildings, crediting Interest on Investment, as follows: 4% on a valuation of \$110 per acre (the cost price) is to be charged to each of the several Field, Swine, Household and General Expense accounts on a basis of the acreage presented in problem 3, and as modified above for fields Nos. 3a and 3b. Charge 4% on the value of buildings to the several elements occupying them, crediting Interest on Investment, assuming the house valued at \$1000 and all others, including the silo, at \$2000. (Debit Household with the \$40 and Building Expense with the \$80. The latter will be distributed over the proper accounts at the close of the year, along with other items of expense in connection with buildings.)

Apr. 8. Purchased 70 bushels of oats at 80c a bushel, and sowed them in field No. 2.

May 4. Planted 4 bu. of seed corn at \$3.50 a bushel in field No. 1.

May 8. Planted 7 bu. of seed corn at \$3.50 in field No. 4.

July 14. Took 80 tons of clover hay from field No. 3b.

Aug. 15. Threshed the oats from field No. 2. They measured

1630 bu. There was estimated to be 40 tons of straw at \$6 a ton.

Aug. 15. Paid \$68 expenses for threshing.

Oct. 10. Used 10 acres of corn from field No. 1 in silage. The yield was estimated by test at 40 bushels per acre, and the market price was \$1.40 a bushel. Eighty-five tons of silage were produced.

Oct. 10. Paid \$22 for engine hire and coal in filling silo.

Oct. 15. Took a second crop of clover hay from field No. 3b, estimated at 35 tons.

Dec. 4. Corn husking resulted in the following memorandum report being submitted for entry: The remaining 10 acres of field No. 1 yielded 400 bushels. The 40 acres of field No. 4 yielded 2000 bushels.

Feb. 28, 1918. Other transactions of the year, ordinarily entered from time to time as they arise, but summarized here for the purpose of reducing details to a minimum, resulted in the following aggregates:

Sold 5420 lbs. (27) of hogs at an average price of \$13.50 per cwt. for cash.

Sold 26,000 pounds of milk to the creamery, receiving \$520 in cash.

Sold 170 bushels of wheat for \$382.50.

Sold 250' bushels of oats for \$150 cash.

Sold 2000 bushels of corn for \$4000 cash.

Paid \$125 for baling 100 tons of hay from stacks and field; also paid \$90 for baling 100 tons of straw.

Sold 100 tons of baled hay, clover and timothy, at an average price of \$15 a ton cash.

Sold 100 tons of baled straw for \$590 cash.

The household was charged with the following commodities: eggs produced, 325 dozen, at a total value of \$81; milk consumed, 2000 lbs., at a total value of \$38; poultry consumed \$12; pigs butchered \$35.

Sales of eggs for cash during the year amounted to \$65.25, being for 225 dozen.

The household received \$50 from the sale of fruit and vegetables during the year.

Paid \$20 for equipment repairs, oil, etc.

Sundry expenses paid for horses amounted to \$35.

calculations. This may be done as shown under instruction 7, problem 3.

8. Calculate the hourly cost of labor, and the total value of labor on each farm element for the year. Record the amounts, for convenience, on the paper as described under instruction 7, problem 3.

9. Make a journal entry for the value of labor calculated in instruction 8. Post the entry.

10. Calculate the hourly cost¹ of horse labor, and the total value of horse labor on each farm element for the year. Record the amounts, for convenience, on the paper as described under instruction 7, problem 3.

11. Make a journal entry for the value of horse labor calculated in instruction 10. Post the entry.

12. Distribute, by journal entry, the building expenses over the various elements using them, according to the following rather arbitrarily selected percentages: Household, 20%; swine, 10%; cattle, 15%; horses, 25%; poultry, 5%; corn, 5%; silage, 5%; equipment expense, 5%; hay 10%.

13. Calculate the cost per hour of maintaining equipment during the year, as explained under instruction 12, problem 3.

Make an entry to distribute the expense over the various farm elements, disregarding any charge that might be made to Building Expense. Post the entry.

14. Calculate and enter the inventories or deferred charges to field accounts which are to be carried over to next year's operations.

In Field No. 1 consider that 20% of the \$90 original deferred charge was absorbed by the current year. This leaves only 10%, or \$9, to carry down. Consider also that 40% of the \$20 for manure was absorbed during this the first year of its application. This leaves \$60%, or \$12, to carry down.

Do not overlook the labor, horse labor and equipment use items in Field No. 2 for 1918 crops.

¹ In order to provide for the proportion of building expense chargeable to horses but not yet entered in the account, add one cent to the hourly rate otherwise calculated. A 21 cent rate is, therefore, the one to apply.

Disregard any deferred charges in Field No. 3a.

In Field 3b, also, the charge for manure is so small that it may be disregarded.

After crediting the inventories as suggested above, complete the entries in the several field and crop accounts, to show the total and unit costs of producing the crops in the fields. Bring the inventories of fields down below the rulings.

15. Transfer the balances of Equipment Expense, Labor and Exchange Labor into General Expense account, ruling off the accounts closed.

16. Distribute, by journal entry, the general expenses over the productive elements, using the following percentages for the purpose of obtaining uniformity: cattle, 22%; swine, 15%; poultry, 1%; corn, 17%; oats, 15%; wheat, 5%; soy beans, 5%; hay, 15%; straw, 5%. Post the entry.

17. Make entries for the following inventories of livestock and commodities on hand at the close of the year, transferring, by journal entry, to Loss and Gain account the balances of all accounts open on the books that show either a loss or a gain. This includes the balance of Field No. 5, which is an extraordinary loss. Post the entries, making sure that all necessary accounts are ruled off and balances or inventories brought down. Inventories Feb. 28, 1918: Horses (10), \$1250; cattle (17), \$610; swine (45), \$900; poultry (100), \$50; corn, 900 bu. at 48.5c (cost), \$436.50; oats, 1100 bu. at 40c (cost), \$440; hay, 60 tons at \$6.32 (cost), \$379.20; straw, 40 tons at \$6.00, \$240.00; silage, 75 tons at \$9.21 (cost), \$690.92; household furnishings, \$400.

INSTRUCTIONS AFTER CLOSING

(a) Take a trial balance which will serve also as a Statement of Resources and Liabilities as of Feb. 28, 1918.

(b) Study the accounts carefully. Compare them with the corresponding ones of the two preceding years. Scrutinize the Loss and Gain accounts of the three years together. Do the same with the three trial balances after closing.

(c) Preserve the books, accounts and records for use in the problems of Chapter X which call for further analysis of these accounts.

REVIEW QUESTIONS

1. What is a farm plot? What is its purpose from an accounting viewpoint?
2. State three reasons for keeping an account with each field in addition to one with each crop.
3. With what amounts is a field account debited at the beginning of a year? During a year?
4. What items are recorded on the credit side of a field account? What are the debits made at the same time? What does the balance of a field account show after inventories are considered?
5. Distinguish between production costs and harvesting costs.
6. Describe the detailed operation of a field account, emphasizing the time of making entries, and recording of inventories or deferred charges.
7. When is a crop account debited? When credited?
8. How is a crop inventory recorded?
9. What does the balance of a crop account show after considering inventories?
10. Discuss the handling of the Silage account and the reasons supporting its use.
11. What is the object of a Seed account? When and for what value is it debited? Credited?
12. Discuss the theory supporting the entries for milk, eggs, garden and other products produced or used by the household.
13. How is a pasture treated in the accounts? How does such treatment differ from that of other fields? Why?
14. What use is made of the account called By-products?
15. What are the two essential elements to consider in distributing rent over various farm elements?
16. When is the rent distributed? How is it distributed?
17. What difference is there in the treatment of rent under the cash and share basis?
18. How would you handle a transaction in which promissory notes were given for rent before the beginning of the year to which they apply?

19. Describe the operation of the Rent Adjustment account.
Why is such operation justified?
20. Should the cost of production vary with the selling price of commodities produced? Why?
21. When is the Equipment Expense account debited?
22. How is Equipment Expense distributed over the several farm elements? State both the theory and the method.
23. Why is it important to post all debits and credits arising from horse labor before effecting a distribution of Equipment Expense in the horse labor summary?
24. What distinction is sometimes necessary in the accounts in order to keep the transactions with work horses separate from other horses? Why is such distinction made?
25. What are deferred charges? How are they shown in the accounts?
26. How is manure handled in the accounts when hauled from the barnyard to the fields?
27. Is all of the manure applied to a field in a given year considered as a cost of producing the next crop therein? How are the accounts made to show the correct state of affairs in this respect?
28. What treatment is advocated for losses and gains of an extraordinary nature?
29. Why is interest considered as an element of cost? Under what conditions would it not be necessary to consider it as such?
30. The practice of considering interest as an element of cost has what effect on the net loss or gain as an individual as shown by the Loss and Gain account? What effect does it have on the net loss or gain of any specific productive element? What effect on the income as a farmer? What effect on the income due to management?
31. What entry is made for interest on land? Interest on buildings? Interest on livestock? Interest on equipment? At what time of the year are each of the entries made for Interest on Investment?
32. Compare charges for rent on the books of a tenant with

the charges to which they correspond on the books of a landlord operator.

33. What treatment is suggested for handling Interest on Investment when the property is mortgaged?
34. Why is interest on working capital not considered as an element of cost in practice? Should it be theoretically?
35. State briefly the object of "closing" the books in the way they are closed under a cost system.
36. Outline the general plan of closing, emphasizing the logical order.
37. Why are the several steps in the detailed process of closing arranged in the order shown?
38. In what way may one modify his cost system in order to get reasonable results without numerous details?
39. What should be done with the ledger accounts after closing?

CHAPTER X

INTERPRETATION OF COST ACCOUNTS

Importance of Correct Interpretation.—It is an old saying that “Figures do not lie, but liars figure.” This would be more in accordance with facts if it read, “Figures do not lie, but their interpreters are inclined to make them lie.”

A large group of figures assembled during the course of a year's operations on a farm may be made to tell a great many different things about the farm's condition and progress in general or in detail. What they tell depends largely upon the way they are analyzed, correlated and studied; and upon the degree of accounting intelligence used in such analysis, correlation or study.

Under the preliminary discussion of cost accounting, one of the purposes of a cost system was given as the forming of a basis of constructive criticism. This is undoubtedly one of the greatest benefits to be derived from the keeping of cost records. It takes time and patience to keep cost records. Unless some intelligent use is made of the records and accounts, the time might be considered as wasted. If the accounts and records are studied carefully, the time used in keeping them is very profitably spent. *One can usually find a means of reducing expenses or increasing production in one way or another if he studies his cost accounts carefully.*

The benefits of a proper study and interpretation of farm records is very nicely summarized by Mr. E. L. Currier, Assistant in Farm Management, Montana Agricul-

tural College, when he states in Circular 43 of the College Experiment Station that:

“A careful study should be made of each account and of the business as a whole in order to learn how to improve it. Farm accounts, as stated before, are of little value unless they teach how to organize the business so that greater profit will result. The outcome of a year's record-keeping often furnishes many surprises. Frequently some enterprise that was looked upon as a mainstay of the business returns a loss, while some more common enterprise to which less attention was given is the source of the real profit. Caution, of course, must be exercised in interpreting results. It must be borne in mind that the figures are for one year only, and that weather, crop, and market conditions may not all have been normal. The normal cost and the normal value of the product must be kept foremost in mind, and if the average market price for a number of years is not above the normal cost of production the enterprise should be discontinued.

“Besides the satisfaction in knowing the cost and profit from each enterprise, the records are valuable in other ways. They may be used to study the seasonable distribution of labor as a whole and on separate enterprises.

“By keeping such records one is sure to gain a better idea of the value of labor. He sees that it is just as important to save an hour's work by man and team on an acre of oats as it is to get a yield of an extra bushel per acre, and that it is more wasteful to have a team idle than to have a man idle for the same length of time.”

Labor Incomes of Landlord Operators.—A Farm-Management Survey of three representative areas in Indiana, Illinois and Iowa¹ has brought out some very interesting facts concerning the labor income of landlords and tenants. The survey includes data from about 700 farms, some be-

¹ Bulletin 41 of the U. S. Dept. of Agriculture.

ILLUSTRATION 58

TABLE III—VARIATION IN LABOR INCOMES ON 273 FARMS OPERATED BY OWNERS IN INDIANA, ILLINOIS, AND IOWA

Labor Income Received	No. of Farms	Percentage of Total Number	Labor Income Received	No. of Farms	Percentage of Total Number
—\$500 and more	26	9.9	\$801 to \$1,000....	13	4.7
—\$499 to —\$200	23	8.4	\$1,001 to \$1,500..	19	6.9
—\$199 to \$0....	40	14.7	\$1,501 to \$2,000..	10	3.6
\$1 to \$200.....	53	19.4	\$2,001 to \$3,000..	5	1.8
\$201 to \$400....	34	12.4	\$3,001 to \$5,000..	3	1.1
\$401 to \$600....	23	8.4	\$5,000 and over...	4	1.4
\$601 to \$800....	20	7.3			

ing operated by the landlords themselves and some by tenants. The quotations from the bulletin, as stated below, bring out the relation between the labor income of the landlord operator and the tenant operator; also the relation between the amount of the total income of the rented farm that goes to the tenant and to the landlord.

“The assertion that farmers are making large profits is erroneous. They are living on the earnings of their investment and not on the real profits of the farm. A farmer having an investment of \$20,000, with no mortgage, may receive a minus labor income, yet have nearly \$1000 as interest on which to live. It is assumed in this discussion that capital should return 5 per cent before allowing the farmer anything for his labor.

“In Table III (Illustration 58)¹ the farms are divided according to the labor income received. Each group gives the number of men who made labor incomes ranging from minus \$500 and more to over \$5000.

¹The Illustration numbers are inserted by the author and are not quoted from the bulletin.

“One farmer out of every 22 received a labor income of over \$2000 a year. One farmer out of every three paid for the privilege of working his farm, that is, after deducting 5 per cent interest on his investment he failed to make a plus labor income.”

Incomes Received by Farm Tenants.—“There are few regions in the United States where tenant farming has been developed so extensively and where it plays such an important part in agricultural production as in the corn belt. The percentage of farms worked by tenants is second only to those operated by owners, and the areas farmed and the products grown compare very favorably with those of the farm owners.

“In the region covered by this survey, records were secured from 247 tenant farmers. These men rented one farm, or land owned by one person. There were 51 other tenants who rented farms from two different parties. Their records show the same results, which have not been included in Table IV (Illustration 59).

“Most tenants hope to become farm owners as soon as they have sufficient capital. The income they receive while leasing a farm is a measure of the period they will have to work before making the change. The average tenant in Indiana, with an investment of \$1758, received \$755 for his year's work. In Illinois, with an investment of \$2867, he received \$1139 as a labor income. In Iowa, with an average capital of \$2667, his labor income was \$716. Owing to drought in early summer, the income of the tenant in Iowa was probably 20 per cent less than it would have been in a normal crop year.

“The 247 tenant farmers make an average labor income of \$870 from an investment of less than \$2500. When it is remembered that the farm owners with over 12 times this investment made less than half the labor income of

ILLUSTRATION 59

TABLE IV—AVERAGE CAPITAL, RECEIPTS, EXPENSES, AND PROFITS OF TENANTS ON 247 FARMS OPERATED BY TENANTS IN INDIANA, ILLINOIS, AND IOWA

Items	Indiana (83 Farms)	Illinois ^a (71 Farms)	Iowa (93 Farms)	Average (247 Farms)
Average area (acres).....	128	202	187	172
Average capital.....	\$1,758	\$2,867	\$2,667	\$2,431
Average receipts.....	1,335	2,257	1,605	1,732
Average expenses.....	492	975	755	740
Average farm income.....	843	1,282	850	992
Average interest at 5 per cent....	88	143	134	122
Average tenant's labor income...	755	1,139	716	870

the tenants, the evidence is unmistakable that the man with small capital should rent rather than buy a farm.

“For the amount invested, the tenant's income is very much greater than that of the farm owner. The sum available for the family living, however, is smaller in the case of the tenant, for the farm owner, with an average capital of \$30,606 (see Table II), has \$1530 interest to use, as well as the \$408 labor income. Thus, if the farm owner is free of debt, as one-half of them are, he has \$1938 available for a living, as compared with the tenant's \$992.

“In addition to this sum available for a living, each has what the farm furnishes in the shape of produce. After the tenant pays his living and personal expenses out of this amount his savings can not be large. If we allow the owners 3.5 per cent on their investment instead of 5 per cent they would then receive approximately the same labor income as the tenants (\$870). This percentage is the same as that received by the landlords from the rented farms.

ILLUSTRATION 60

TABLE V—AVERAGE CAPITAL, RECEIPTS, EXPENSES, AND PROFITS
OF LANDLORDS FOR 247 FARMS OPERATED BY TENANTS,
AS SHOWN IN TABLE IV

Item	Indiana (83 Farms)	Illinois (71 Farms)	Iowa (93 Farms)	Average (247 Farms)
Average area (acres)	128	202	187	172
Average capital	\$18,423	\$36,479	\$20,728	\$25,210
Average receipts	1,002	1,538	1,014	1,185
Average expenses	351	213	354	306
Average farm income	651	1,325	660	879
Average profit on invest- ment ¹ (per cent)	3.53	3.64	3.19	3.5

¹ Obtained by dividing the farm income by the average capital.

Taking into consideration the results from all the farms managed by owners and by tenants, they show that a return can be expected of 3.5 per cent on the investment and a labor income of \$870.

Incomes Received by Absentee Landlords.—"The farm, in the case of the landlord, is a business investment. He furnishes the capital, largely in the form of land, and the tenant furnishes the necessary labor and other means for its operation. The average investment of the 247 landlords for the three States studied was \$25,210. The average net income on the capital invested was 3.5 per cent. All items of expense, including repairs, seeds, taxes, and insurance, were deducted before figuring the net returns. Table V (Illustration 60) gives the average capital, receipts, expenses, and returns for the landlords in each State.

“The average return on investment from the farms in Illinois was 3.6 per cent, in Iowa 3.2 per cent, and in Indiana 3.5 per cent. The income is a moderate return on the large capital, considering the enormous rise in land values during the past 10 years. In computing this income no credit has been allowed for the rise in value of real estate, except in case of actual improvements.

“There has been a marked tendency throughout the entire country to consider the farm more and more as a business proposition. The landlord who is receiving 3.5 per cent net from his farm, with the bare land figured at \$150 or more an acre, has a good, safe investment. It would seem from the results that if the year studied was a normal one, land in the corn belt is not overvalued. Changes in the price of the staple products, such as corn or oats, or material changes in the cost of production of these crops would be reflected in the price of farm land. Unless the price of corn becomes much higher for the next period of years, a pronounced increase in the value of land in this region can not be expected.

“The advisability of buying a farm as an investment with the intention of not living on it is often a perplexing question.

Variation in the Profits of Absentee Landlords.—“Table VI (Illustration 61) gives the variation in the landlords’ returns in the three States studied.

“Out of 247 men 6 received less than 1 per cent on their investments. The same number received between 7 and 8 per cent; none received over 8 per cent. It is clear that no phenomenal returns can be expected from capital put in farm land in those States at the present time. It is believed that the data in Table VI (Illustration 61) are a very good indication of the returns one may expect from a farm investment in those districts. The chances of making more than 5 per cent are about 1 in 10.”

ILLUSTRATION 61

TABLE VI—VARIATION IN PROFITS OF LANDLORDS ON 247 TENANT FARMS IN INDIANA, ILLINOIS, AND IOWA

Landlord's Profit on Investment (Per cent)	No. of Landlords	Percentage of Total Number	Landlord's Profit on Investment (Per cent)	No. of Landlords	Percentage of Total Number
Less than 1	6	2.4	4.1 to 5	42	17.0
1.1 to 2	20	8.1	5.1 to 6	13	5.3
2.1 to 3	75	30.4	6.1 to 7	7	2.8
3.1 to 4	78	31.6	7.1 to 8	6	2.4

The figures presented in the quotations above indicate that accounts may be used for finding aggregate results of labor income. Labor income, however, differs with the methods of accounting. In Illustrations 58 and 59 the amounts showing labor income are greater by \$600 than they would be if the operator's labor were charged as an expense before finding the farm income. In Illustration 59, for example, the average expenses would have been \$1092, \$1575, \$1355 and \$1340 respectively; and the average tenant's labor income \$155, \$539, \$116 and \$270 respectively had \$600 been charged in the accounts for operator's labor before finding the average farm income. In this case, however, the \$155, \$539, \$116 and \$270 would not be labor income, but would be known as wages of management. The \$600 is the amount charged to the various farm elements because of the operator's physical labor for the year. The \$155 is the amount of income for the year, representing the part of the total income due the operator for his risk and ability in managing the farm for the year.

Meaning of Cost.—One of the main functions of keeping accounts on a farm should be to show the cost of producing the various productive elements. It is essential that the

accounts kept should not be misinterpreted with respect to the cost of production and operation.

When one is asked by his neighbor, "What did it cost you last year to raise a bushel of corn?" he naturally quotes a figure obtained from his Corn account as described under "Operation of Crop Account," Chapter IX. If both men in question have kept accounts, a discussion and a general comparison of costs is likely to arise. Before they start such a comparison, the first step should be to make sure that both have the same thing in mind when speaking of "cost." Unless such an understanding is reached first, one man might have in mind all the charges to the Corn account, while another might have in mind only the cost up to the time of harvest. It has been pointed out that the cost of production is found in the field account and transferred to the crop account as a single item. The cost of handling, storing and selling is shown in the crop account only. The aggregate cost up to the time the crop is sold or fed is called the "Total Cost." The production cost and the total cost per bushel are both figured on the number of bushels harvested.

In order to compare costs intelligently, care should be taken that the total cost of any productive element does not include extraordinary losses due to fire, runways, disease and similar causes. For example, under ordinary conditions, the various elements might be charged with horse labor on a basis of the net expense and loss in connection with horses. If such expense and loss consists of, say, \$500 for loss of horses due to disease, this \$500 should be transferred directly to Loss and Gain account as an extraordinary loss.¹ In this way, the crop accounts would not be called upon to assume this loss in the form of increased cost of production or selling. A loss of this nature is a

¹See Death of Livestock and Illustration 32, Chapter VII.

plain reduction of capital for which the crops are not responsible.

Extraordinary losses in crops due to flood, frost or general weather conditions are losses that do not have a very great effect upon the aggregate cost of production. They do have an effect upon the cost per bushel or ton, because of the reduction in the size of the crop harvested. Weather conditions, however, might cause an increase in the aggregate cost of the crop when they necessitate replanting, or when poor roads increase the cost of marketing. On the other hand, such conditions might cause a reduction in the cost of the crop if continued rains prevent proper cultivation.

For all practical purposes, then, the aggregate production cost and total cost are not affected by weather conditions, while the unit costs are so affected.

Meaning of Profit.—As in the case of the term “cost” there is also a great opportunity for variations in the meaning of the word “profit.” When a man says that he has made a profit of \$1200 on hogs during a given year, what does he mean? When he says he has made a profit of \$400 on alfalfa, what does he mean? Unfortunately it is usually impossible to say just what he means without first finding out what elements of expense and income he considered before deriving the figure which he calls “profit.” It is to be hoped that as the science of farm accounting develops, there will be a more common understanding of the use of the fundamental terms.

The meaning of the word “profit” depends upon several conditions.

1. The system of accounting used, i.e., whether a general or cost system.
2. The values used in calculating labor, horse labor, feed consumed and depreciation.
3. The consideration of the operator's wages, say \$600,

and of interest as elements of cost; and the rate of interest used when it is considered.

In the comparison of the accounts of L. E. Fay as kept under the general and cost systems (Illustrative Problem 2, Chapters VIII and IX) it was found that a considerable difference in profits on the several productive elements existed under the two systems, although the net profit on the whole farm was the same. Under the general system, a given crop showed a greater profit than under the cost system if all of it was sold in the market. It showed less profit under the general system if fed to livestock. These differences arose because the cost system recorded charges for labor, horse labor, equipment use and other costs that were not recorded under the general system. Also, the cost system recorded credits for the value of quantities fed to livestock, while the general system did not.

Similarly, swine showed greater profit under the general system than under the cost system, due largely to the fact that a large part of the expense for labor and feed was not charged to the hogs under the general system.

The second condition named as affecting the meaning of profit is value of labor, horse labor, feed and depreciation. The figures to use in calculating these elements of cost have been discussed under their respective titles. A further presentation is given in the Appendix. Anything that will tend to standardize the values charged for these costs will assist materially in affording a valuable comparison of results among farmers.

The effect of the operator's wages on the profit of a farm was stated above in connection with the labor income explanations.

The consideration of interest as an element of cost and the rate of interest used have a considerable bearing upon the profit of any productive element, but no effect upon

the aggregate profit of the individual as shown in the Loss and Gain account.¹ In any particular crop account, an absence of a charge for interest on investment will result in less cost and, therefore, greater profit than when interest is included as an element of cost.

In brief, it can be said, then, that *a comparison of costs or profits is of little or no value unless the costs or profits to be compared are determined under the same general principles. Great care must be exercised in framing policies based on a "cost" or a "profit" quoted by someone else.*

Reading a Loss and Gain Account.—Before attempting to analyze the several productive accounts one should understand first how to analyze the Loss and Gain account. He should learn to know just what the Loss and Gain account tells about his business, his income from investment, income as a manager, income as a laborer and income as a farmer and an individual.

It has been pointed out previously² how to find the profit as an individual and as a farmer, by considering the balance of the Loss and Gain account in connection with the loss or gain transferred from the Household account.

Considering the Loss and Gain account of Illustration 62 one should read the results in some such way as this:

Income as an individual: The \$1400 is the income as an individual since all of the operations of the farm and household are considered in deriving the amount.

Income as a farmer: \$1295 is the income as a farmer shown by the Loss and Gain account in Illustration 62. The amount is found by adding together the net gain of each of the productive elements of the farm, oats, corn, potatoes, swine and cattle. Interest on Investment is not an income of the farmer but of the individual. Interest

¹ Illustrations 54 and 55.

² Pages 195-197.

ILLUSTRATION 62

TYPICAL LOSS AND GAIN ACCOUNT TO BE READ OR ANALYZED

Loss and Gain

Household.....	\$200	Oats.....	\$250
Net Gain to Capital Ac-		Corn.....	400
count.....	1,400	Potatoes.....	375
		Swine.....	60
		Cattle.....	210
		Interest on Investment	305
	<u>\$1,600</u>		<u>\$1,600</u>

is charged to the farming operations by the man as a private individual. Accordingly the income as a farmer, \$1295, is derived after the various productive elements operated by the farmer have been charged with interest on investment.¹ Another way of deriving the same result is to add the \$1400 net gain to the \$200 Household expense and deduct \$305 interest.

Income as a laborer: Under the method of cost accounting advocated in the preceding pages, every Loss and Gain account provides \$600 for the labor of the operator. This is taken care of by the debit to Labor account, and credit to Household. The \$600 is not shown as a separate item but is absorbed in the various productive accounts. Accordingly in reading any Loss and Gain account after such

¹ Considering interest on investment in this way places the "profit as a farmer" of the landlord operator on a basis comparable with the "profit as a farmer" of the tenant farmer. In either case, the profit as a farmer is the sum of the profits from each of the productive elements. Each productive element in turn has been charged with rent or its equivalent in interest, depreciation, repairs and so on.

an entry has been made, one may know that the account provides for \$600 for the labor of the operator whether he be a tenant or owner.

Income from Investment: The income from the investment in farm property is very easily determined from such a Loss and Gain account. The \$305 is the interest on the investment in equipment and livestock, assuming that the operator in question is a tenant. If he is a landlord, it would include interest on land and buildings also.

Income as a manager: With the \$600 labor, and the proper amount of interest on investment already charged to the various productive elements the compensation for risk and management is \$1295 ($1400 + 200 - 305$). The \$305 is deducted because it is considered as an income of the individual which is not affected by the managing ability of the operator, and which does not measure any risk since it is charged to the productive elements regardless of all other conditions.

The \$305 interest in this case and in other similar cases might be credited to Household account. Since it is credited to a separate account, Interest on Investment, it may be considered for analytical purposes as part of the Household credits.

Analysis and Comparison of Results.—Analyzing ledger accounts and framing suitable comparisons therefrom constitute two of the most valuable points of assistance in the interpretation of accounting results. The preparation of analytical and comparative tables involves a knowledge of statistical as well as accounting methods.

The term "cost records" is not confined to the forms and methods used in collecting the information concerning the inter-related farm elements. It is used also to designate any tables and analyses that might be prepared to assist in interpreting the data and the various accounts. Such records are the most important part of a cost accounting

system, as they form the basis for direct conclusions in framing the policies of management.

An analysis is necessary to assist in finding the causes of things, because each element of expense or income can be examined separately. It is easier, for example, to verify the reasonableness of a charge for labor on a crop than to take all charges together in an effort to determine whether the total cost seems reasonable.

A comparison of results is highly desirable because of the recognized truth in the statement, "When there is nothing to compare, there is nothing to criticize." Comparison of results may be of one year with another; one farm with another; one crop or field with another; or one farm with the average of a group of farms obtained by experiment under similar conditions of soil, climate and topography.

Using the principles of accounting as presented in this volume, *the Ledger account is the starting point for all analyses and comparisons of results*. Some of the detailed features of analytical and comparative tables are presented in the several pages that follow.

Comparative Analysis of Crop Account.—The preparation of comparative figures showing detailed costs of producing and disposing of a crop this year, as compared with one or more other years, is quite essential. Such figures are obtained from the appropriate crop account and the accounts with the fields in which the crop was produced.

As an example, presume that a comparative analysis of Corn account is to be prepared for 1916, 1917 and 1918. We shall trace the figures for 1917 through the three fields, Nos. 5, 6 and 7, into the Corn account for 1917 and thence into the Comparative Analysis of Corn account, as follows:

The three field accounts and the Corn account appear as in Illustration 63, immediately after closing the books for the year, and before preparing the analysis.

Using the figures presented in the accounts of Fields

Nos. 5, 6 and 7 and the Corn account as in Illustration 63, the Comparative Analysis of Corn account appears as in Illustration 64. The figures for the year 1917, ending Feb. 28, 1918, are obtained from the accounts of Illustration 63. The others for the year ending Feb. 28, 1917, are shown only to assist in discussing the analysis. A study of the Comparative Analysis is necessary in order to determine just how all the 1917 figures are obtained from the accounts of Illustration 63.

Preparation of the Comparative Analysis.—The first item for the year ended Feb. 28, 1918, in the comparative analysis of Illustration 64, "Fertilizer \$22.50," is obtained from the field accounts of Illustration 63 in this manner:

Field No. 5 Dr. On hand at start.....	\$36.00	
Less Cr. On hand at close.....	27.00	\$9.00
	<hr/>	
Field No. 6 Dr. On hand at start.....	\$8.00	
Dr. Applied in Year.....	22.00	
	<hr/>	
	\$30.00	
Less Cr. On hand at close.....	19.60	10.40
	<hr/>	
Field No. 7 Dr. On hand at start.....	\$2.00	
Dr. Applied in year.....	6.20	
	<hr/>	
	\$8.20	
Less Cr. On hand at close.....	5.10	3.10
	<hr/>	
Total fertilizer consumed by crop of 1917..	<hr/>	<u>\$22.50</u>

The cost of seed is obtained by the mere process of adding the three items as shown in the field accounts of Illustration 63, thus:

Field No. 5.....	\$5.10
Field No. 6.....	5.25
Field No. 7.....	1.40
	<hr/>
Total seed used in 1917 corn crop..	<u>\$11.75</u>

ILLUSTRATION 63

FIELD AND CORN ACCOUNTS CLOSED AND READY FOR ANALYSIS

Field No. 5

(Year 1917) 25 Acres

1917		1917	
Apr. 1 Fertilizer.....	\$36.00	Nov. 30 1109½ bu. to	
May 1 Seed.....	5.10	corn a/c at	
		25.7 cents....	\$285.56
1918		1918	
Feb. 28 Labor for year..	51.90	Feb. 28 Labor Invty...	14.00
Feb. 28 Horse Labor yr.	65.86	Feb. 28 Horse Labor In-	
Feb. 28 Int. on Invest..	175.00	ventory.....	17.30
Feb. 28 Equip't Exp...	10.00	Feb. 28 Fertilizer.....	27.00
	<u>\$343.86</u>		<u>\$343.86</u>
1918			
Mar. 1 Labor Invty...	\$14.00		
Mar. 1 Horse Labor In-			
ventory.....	17.30		
Mar. 1 Fertilizer.....	27.00		

Field No. 6

(Year 1917) 25½ Acres

1917		1917	
Mar. 1 Labor Invty...	\$10.00	Nov. 30 1216 bu. to corn	
Mar. 1 Horse Labor In-		a/c at 25.2c..	\$306.85
ventory.....	11.20		
Mar. 1 Fertilizer Invty.	8.00	1918	
Apr. 1 Fertilizer applied	22.00	Feb. 28 Labor Invty...	13.00
May 2 Seed.....	5.25	Feb. 28 Horse Labor In-	
1918		ventory.....	16.00
Feb. 28 Labor for year..	48.60	Feb. 28 Fertilizer.....	19.60
Feb. 28 Horse Labor yr.	62.10		<u>\$355.45</u>
Feb. 28 Int. on Invest..	178.50		
Feb. 28 Equip't Exp...	9.80		
	<u>\$355.45</u>		
1918			
Mar. 1 Labor Invty...	\$13.00		
Mar. 1 Horse Labor In-			
ventory.....	16.00		
Mar. 1 Fertilizer Invty.	19.60		

ILLUSTRATION 63—Continued

Field No. 7

(Year 1917) 6½ Acres

1917		1917	
Mar. 1 Labor Invty.....	\$3.00	Nov. 30 300 bu. to corn	
Mar. 1 Horse Labor In-		a/c for silage	
ventory.....	3.00	@ 27.3 ct.....	\$81.80
Mar. 1 Fertilizer Invty...	2.00		
Apr. 1 Fertilizer appld...	6.20		
May 4 Seed.....	1.40		
1918		1918	
Feb. 28 Labor for year....	13.10	Feb. 28 Labor Invty.....	2.80
Feb. 28 Horse Labor for		Feb. 28 Horse Labor In-	
year.....	16.30	ventory.....	3.10
Feb. 28 Int. on Invest.		Feb. 28 Fertilizer Invty...	5.10
year.....	45.50		
Feb. 28 Equipt. Exp. yr..	2.30		
	<u>\$92.80</u>		<u>\$92.80</u>
1918			
Mar. 1 Labor Invty.....	\$2.80		
Mar. 1 Horse Labor In-			
ventory.....	3.10		
Mar. 1 Fertilizer Invty...	5.10		

Corn (Year 1917)

1917		1918	
Mar. 1 Invty. (1640 bu.)	\$656.00	Feb. 28 Fed during yr.	
Nov. 30 From Field No. 5		per feed sum-	
(1109½ bu.).....	285.56	mary 1250 bu.	
Nov. 30 From Field No. 6		@ \$1.20.....	\$1,500.00
(1216 bu.).....	306.85	Feb. 28 Sold 1685 bu. @	
Nov. 30 From Field No. 7		\$1.23.....	2,072.55
(300 bu.).....	81.80	Feb. 28 Silage 300 bu. @	
1918		\$1.20.....	360.00
Feb. 28 Labor for year...	83.20	Feb. 28 Invty. 1030½	
Feb. 28 Horse Labor yr..	94.90	bu. @ 35 cents.	360.67
Feb. 28 Equipt. Exp.....	14.70		
Feb. 28 Building Exp....	20.80		
Feb. 28 General Exp.....	40.50		
Feb. 28 To Loss & Gain			
a/c, Net Gain for			
year.....	2,708.91		
	<u>\$4,293.22</u>		<u>\$4,293.22</u>
1918			
Mar. 1 Invty 1030½ bu.			
@ 35 cents.....	\$360.67		

ILLUSTRATION 64

COMPARATIVE ANALYSIS OF CORN ACCOUNT, FOR YEARS 1916, 1917 AND 1918

	For Year Ended		
	Feb. 28 1917	Feb. 28 1918	Feb. 28 1919
<i>Cost of Production</i>			
Fertilizer.....	\$18.00	\$22.50	
Seed.....	10.80	11.75	
Labor.....	102.20	96.80	
Horse Labor.....	131.15	122.06	
Rent or interest on land.....	350.00	399.00	
Equipment expense.....	25.00	22.10	
(1) Cost of Production for the year.....	\$637.15	\$674.21	
(2) Cost of Production for the year, per acre.....	\$12.74	\$11.83	
(3) Cost of Production for the year, per bu.....	.254	.257	
<i>Cost of Harvesting and Housing</i>			
Labor.....	\$80.25	\$83.20	
Horse Labor.....	90.40	94.90	
Equipment Expense.....	14.00	14.70	
Building Expense.....	21.00	20.80	
General Expense.....	50.70	40.50	
(4) Cost of Harvesting and Housing for the year.....	\$256.35	\$254.10	
(5) Cost of Harvesting and Housing for the year, per acre.....	\$5.13	\$4.46	
(6) Cost of Harvesting and Housing for the year, per bushel.....	.102	.097	
(7) Total cost of Corn for the year, per acre.....	17.87	16.29	
(8) Total cost of Corn for the year, per bu.....	.356	.354	
(9) Total cost of year's crop of Corn.....	\$893.50	\$928.31	
(10) Inventory at beginning of year.....	413.80	656.00	360.67
(11) Cost of all corn available for sale or use during the year.....	\$1,307.30	\$1,584.31	
(12) Deduct: Inventory at close of year.....	\$656.00	360.67	
(13) Total cost of corn sold and used during year.....	\$651.30	\$1,223.64	
<i>Income</i>			
Corn sold.....		\$2,072.55	
Corn fed.....	\$975.00	1,500.00	
Corn used in silage.....	195.00	360.00	
(14) Total income from corn, for the year.....	\$1,170.00	\$3,932.55	
<i>Summary</i>			
(15) Total income from corn.....	\$1,170.00	\$3,932.55	
(16) Less total cost of corn.....	651.30	1,223.64	
(17) Net Gain on corn for the year.....	\$518.70	\$2,708.91	
(18) Net Gain per Acre planted.....	\$10.37	\$47.52	

The cost of labor in production, \$96.80 as in Illustration 64, is obtained from the field accounts in this way:

Field No. 5	Dr. Labor applied.....	\$51.90	
	Less Cr. Next year's part.....	14.00	\$37.90
		<hr/>	
Field No. 6	Dr. From past year.....	\$10.00	
	Dr. Labor applied.....	48.60	
		<hr/>	
		\$58.60	
	Less Cr. Next year's part.....	13.00	\$45.60
		<hr/>	
Field No. 7	Dr. From past year.....	\$3.00	
	Dr. Labor applied.....	13.10	
		<hr/>	
		\$16.10	
	Less Cr. Next year's part.....	2.80	\$13.30
		<hr/>	<hr/>
Total labor used in production of 1917 corn crop.....			<u>\$96.80</u>

The item "Horse Labor \$122.06," shown as part of the cost of production, is obtained in the same way as the labor item analyzed in the preceding paragraph.

That part of the cost of production called "Rent or interest on land," \$399, is obtained by adding together the three items found in the three field accounts, called "Interest on Investment." Similarly, equipment expense figure, \$22.10, is derived from the sum of the three items bearing that title in the field accounts of Illustration 63.

The details of the "Cost of Harvesting and Housing" in Illustration 64 are obtained from the Corn account of Illustration 63. It is observed that the items correspond exactly without any further adjustments. That is, "Labor for the year \$83.20," as stated in the Corn account, is the same as "Labor \$83.20," under "Cost of Harvesting and Housing," in the Comparative Analysis.

It should be observed in studying Illustration 64 that the result designated as “(1),” cost of production for the year, \$674.21, is the sum of the items above it. Also, it is important to note that a very essential verification of this figure (1) may be made from the Corn account, as follows:

From Field No. 5 (1,109½ bu.).....	\$285.56
From Field No. 6 (1,216 bu.).....	306.85
From Field No. 7 (300 bu.).....	81.80

Cost of production for the year....	<u><u>\$674.21</u></u>
-------------------------------------	------------------------

Result (4) in Illustration 64 takes the place of five items in the Corn account, under date of Feb. 28, 1918. Other results in the Comparative Analysis of Illustration 64 not reduced to a unit basis correspond to other figures in the Corn account, the net gain of \$2708.91 being the aggregate result in both cases.

In an analysis of any account, it is essential that all items in the account be considered, and that the result obtained in the analysis be the same as the result in the account.

In order to bring out more clearly the relation between the Corn account of Illustration 63 and its analysis in Illustration 64, the correlation is presented in outline form in Illustration 65.

A study of Illustration 65 together with Illustrations 63 and 64 reveals the fact that the Comparative Analysis of Corn Account uses all of the figures of the Corn account, but merely presents them in a different form and with some of the amounts subdivided to show more of the details. The figures in parentheses, in Illustration 65, as (11), (9), (10), etc., refer to the corresponding numbers of items in Illustration 64. The amounts shown in Illustration 65 are exactly the same as those in Illustration 63, Corn account, and are in the same order.

ILLUSTRATION 65

A CORRELATION OF THE CORN ACCOUNT AND ITS ANALYSIS
(AMOUNTS, SAME AS CORN ACCOUNT ILLUSTRATION 63)

Corn (Year 1917)

(11)	{	(9)	{	(10)	\$656.00	{	\$1,500.00		
				(1)	285.56		(14)	2,072.55	
					306.85			360.00	
					81.80			(12)	360.67
					83.20				
				94.90					
				(4)	14.70				
					20.80				
					40.50				
					(17)		\$2,708.91		
					\$4,293.22		\$4,293.22		

Considering Illustration 64 again and the figures for the year ended Feb. 28, 1918, the amounts bearing numbers to the left are obtained as follows:

(1) The sum of the items above it.

(2) The \$11.83 per acre is found by dividing 674.21 by 57. The latter figure is the total acreage of Fields Nos. 5, 6 and 7, obtained from the accounts or the farm plot, thus:

Field No. 5.....	25	acres
Field No. 6.....	25½	acres
Field No. 7.....	6½	acres
		<u>57</u>
		<u>acres</u>

(3) The 25.7 cents per bushel is obtained by dividing 674.21 by 2625½. The latter figure is the number of bushels of corn harvested from the several fields during the

year. It includes the number of bushels husked, plus the estimated number of bushels on the stalks cut for other purposes ($1109\frac{1}{2}$ plus 1216 plus 200 = $2625\frac{1}{2}$).

(4) The sum of the five items immediately above.

(5) This is the quotient of 254.10 divided by 57, the latter being the number of acres planted in corn.

(6) This figure, 9.7 cents per bushel, is the quotient of 254.10 divided by $2625\frac{1}{2}$ [See (3)].

(7) Obtained by addition of (2) and (5).

(8) Obtained by addition of (3) and (6).

(9) The sum of (1) and (4).

(10) The inventory at the beginning of the year is taken from the Corn account, it being the first debit item therein. It should be noted that in the column for the year ended Feb. 28, 1919, the result (10) is the same as result (12) in the year ended Feb. 28, 1918. Likewise, result (10) in the year ended Feb. 28, 1918, is the same as result (12) in the year ended Feb. 28, 1917.

(11) The sum of (9) and (10).

(12) The inventory at the close of the year is taken from the Corn account, it being the last item on the credit side, in Illustration 63.

(13) The difference between (11) and (12).

(14) This is the sum of the three items above, which items are obtained from the credit side of the Corn account.

(15) This is the same as (14).

(16) This is the same as (13).

(17) The difference between (15) and (16).

(18) This net gain per acre planted is the quotient of 2708.91 [result (17)] divided by 57, the number of acres planted.

A Study of the Comparative Analysis.—After completing the Comparative Analysis of a given crop for any year, as presented in Illustration 64, it is highly desirable for

the farm operator to study it carefully. As previously suggested, such study is more likely to give good results if it is made in a comparative way.

In making the comparative study of the figures for the years ended Feb. 28, 1917, and Feb. 28, 1918, it should be stated first that the same fields were not used for corn in each of the two years. In the first year the corn acreage was 50, while in the second year under consideration it was 57. The number of bushels harvested in the year ended Feb. 28, 1917, was 2510, as compared with 2625½ in the year following.

As the Comparative Analysis is prepared in Illustration 64, it is possible to bring out two main points between the years under consideration: 1. The results of management. 2. The result of market conditions.

In this connection, item (9), "The total Cost of year's crop of corn," is the one which indicates whether the men, horses and equipment have been handled economically or not. Results (2), (5) and (7), Cost per Acre, should be quite uniform one year with another, depending only slightly upon weather conditions, and somewhat upon the sizes of the fields used. The per bushel cost as calculated in results (3), (6) and (8) is very likely to fluctuate considerably. It is low under favorable weather conditions and high under unfavorable conditions.

However, good farm management can have considerable effect on the per bushel cost. Proper rotation, fertilization, selection of seed and similar elements can increase the yield without a corresponding increase in total cost. Such conditions would decrease the cost per bushel. Excessive applications of fertilizer, however, would not result in a corresponding decrease in the production cost per bushel.

Good management may be reflected in items (10) and (12), inventories. The ability to analyze economic condi-

tions properly may cause the careful farmer to hold his corn in some years and to sell early in other years. It is noticed that in the year ended Feb. 28, 1917, more corn was carried over than in either of the other two years shown in Illustration 64. This seems to indicate that a rise in price was expected during the opening months of the next fiscal year.

Result (13), cost of corn sold and used, does not mean much in a comparative way until it is used in the Summary as (16) in connection with the income shown in result (15) of the Summary.

A comparison of the income items (14) indicates the policy of the farmer to some extent. In one year he does not sell any, but in the next year he sells much. The total income as shown in the Summary of Illustration 64, can hardly be said to reflect the ability of the farmer except as it is reflected through the cost of production per bushel. This is true because all income from corn is figured at market price, and the average farmer does not have much to do with the fixing of the market price. It should be considered that the two years in the Illustration are years of unusually high prices for farm products.

However, it might be said that total income does reflect the farmer's ability in one respect. The farmer who studies national conditions and can foresee a high price for corn, will put in a greater acreage of corn and smaller acreage of some other products. Also, he may be able to sell at the proper time.

Result (17), "net gain on corn for the year," is interesting as a starting point, if one wishes to determine policies for succeeding years, or to examine the causes of the results of the present year.

Result (18), "net gain per acre planted," is a figure that does not reflect the ability of the farmer primarily. This result, together with (17), is a very good one to study

in comparison with other crops for the same series of years.

The Comparative Analysis of a crop account, then, affords an opportunity for studying conditions and methods with a view to making a greater net gain from the crop—greater both in the aggregate and per acre planted. All that has been presented in discussing Corn account applies to any other crop account. Similar Comparative Analysis sheets could be made for each crop. If feasible in any case, and especially when a columnar book can be obtained for the purpose, it is better to have more than three years' results compared. In a good bound columnar book ten years' results could be summarized by writing the items of cost and income only once at the left of the page.

Comparison of Several Crops.—Aside from having an analysis of each crop as outlined above, considerable benefit is to be derived from an analysis of all of the crops produced in a given year. In such an analysis, the same outline would be used as that presented in Illustration 64, the only change being in the heading of the money columns. Comparative Analysis of Crop Accounts is the title of such a table. Illustration 66 presents the general form to be used.

In the use of an analysis like that shown in Illustration 66, the word "bushel" as used in Illustration 64 could be changed to read "bushel or ton," as occasion demanded. The figures for oats, wheat and other crops could be obtained from an analysis of the ledger accounts or from the Comparative Analysis of Oats, Wheat or other account, if such analysis was prepared first.

Comparative Crop Production and Costs.—The Comparative Analysis of Crop accounts as presented in Illustrations 64 and 66, represent only one of several possible types available for arranging the results of the ledger account into a form that may be used as a basis for constructive criticism.

ILLUSTRATION 66

COMPARATIVE ANALYSIS OF CROP ACCOUNTS FOR THE YEAR
ENDED FEB. 28, 1918

	Corn	Oats	Wheat	Alfalfa
<hr/>				
<i>Cost of Production</i>				
Fertilizer.....	\$22.50			
Seed.....	11.75			
etc.				
etc.				
as presented in Illustration 64				
etc. Phrased as to Cost and In-				
come as in Illustration 64.				
<i>Summary</i>				
Total Income				
Less Total Cost				
Net Gain for year				
Net Gain per acre planted				

Only one other type of analysis for this purpose is presented herein. It is called the Comparative Crop Production and Cost Record, an outline of which is given in Illustration 67.

It differs from the Comparative Analysis of Crop Account (Illustration 64) principally in the fact that it attempts to account for all bushels or tons of the crop produced, as well as to show values for production, sales, inventories and other items. The arrangement is also different. In the Comparative Crop Production and Cost Record, an effort is made to trace the quantity and value of a crop from the beginning of the year, through harvest and the disposal of the crop to the inventory at the close of the year.

ILLUSTRATION 67

COMPARATIVE CORN PRODUCTION AND COST RECORD

	Line No.		Year Ended Feb. 28th		
			1917	1918	1919
(1) On Hand at Start	1	No. of bu.	730	1,640	
	2	Value of crop	\$413.87	\$656.00	
(2) Harvested during the year	3	No. of bu	2,510	2,625½	
	4	Total cost of crop	\$893.50	\$928.31	
	5	No. of acres	50	57	
	6	Bu. per acre (Line 3 divided by Line 5)	50	46	
	7	Cost per bu. (Line 4 divided by Line 3)	\$.356	\$.354	
	8	Cost per acre (Line 4 divided by Line 5)	\$17.87	\$16.29	
(3) Total Available for use or Sale	9	Bushels (Line 1 plus 3)	3,240	4,265½	
	10	Value (Line 2 plus Line 4)	\$1,307.30	\$1,584.31	
(4) Available Supply Accounted For	11	Sold and Fed	No. of bu.	1,580	3,235
	12		Value	\$1,170.00	\$3,932.55
	13	On hand at close of yr. inc'l seed	No. of bu.	1,640	1,030½
	14		Value	\$656.00	\$360.67
	15	Shrinkage	No. of bu. Lines 9—(11 plus 13)	20	none
	16		Value (Line 15 x Line 7)	7.12	none
(5) Profit on Crop	17	Net Profit (per ledger a/c) Line 12 plus 14—10	\$518.70	\$2,708.91	
	18	Profit per acre planted, Line 17 divided by Line 5	\$10.37	\$47.52	
(6) Where Harvested	19	Field or fields harvested	Nos. 5 and 8	Nos. 5, 6 and 7	

From a study of Illustration 67, it is observed that there are six main divisions of the subject matter, the first four being subdivided to show quantities as well as values. (1) On hand at the start of the year. (2) Harvested during the year. (3) Total available for use or sale. (4) Available supply accounted for. (5) Profit on the crop. (6) Where harvested.

This form of analysis is meant as a substitute for the Comparative Analysis of Illustration 64. However, both of them could be prepared if the size of the farm warranted such preparation. The "Line No." of Illustration 67 has no special relation to the "Result No." of Illustration 64.

Policies of management may be formulated from a study of the Production and Cost Record of Illustration 67 in a way similar to that described under "A Study of the Comparative Analysis," page 357.

As suggested in connection with the first Crop Analysis, the Comparative Crop Production Record may be placed in a bound columnar book, permitting the figures of from five to ten years to be placed side by side for study and criticism.

Here again, Corn account is used only as an example of crops. The figures taken from the Field and Corn accounts of Illustration 63 are used in Illustration 67, in the column for the year 1917 (ended Feb. 28, 1918). This affords an excellent comparison of the relative value and application of Illustrations 64 and 67, since both are created from the same set of figures.

It should be noted that shrinkage is provided for, but that there was none to report for the year ended Feb. 28, 1918. This undoubtedly is due to the method of taking the inventory of corn on Feb. 28, 1918. The inventory on that date, amounting to 1030½ bushels, was probably obtained by examining the figures for bushels produced.

sold and fed as shown in Corn account (Illustration 63). By arithmetical process it appears that $1030\frac{1}{2}$ bushels should be left after the year's operations. If the farmer examines the crib and thinks that that figure is "near enough" he may use it.

The other method of taking inventory of corn would probably result in a shrinkage being shown. That is, if the farmer measures the crib and calculates the number of bushels, it would quite probably be less than the figures obtained by performing the arithmetical work in connection with the Corn account.

Line 19 of Illustration 67 indicates where the crop was raised in each of the several years. This affords a comparison of methods of farming, rotation, fertilizing and similar elements, if a record is made on the farm plot or elsewhere of the conditions existing in the several fields.

Comparative Production of All Crops.—If it is found desirable in any case to make a comparative study of several crops produced in a given year, the form used in Illustration 67 may be employed without changing the subject matter. It is necessary only to substitute the names of the crops at the heads of the columns in place of the years. Such a table would bear the same relation to Illustration 67 that Illustration 66 bears to Illustration 64.

By making such a table of information, one can study the results of several crops together. Such a table is not advocated as a general rule, since the same effect is to be obtained by placing side by side the Comparative Production Records of the several crops, prepared as in Illustration 67.

Comparison of Fields.—As an aid to good farm management, a Comparative Field Production Record may be prepared from year to year. Such a record could be placed in a bound book having space for several years' figures side by side. Illustration 68 shows a typical out-

line of such a production record for Field No. 5. A separate record is prepared for each field.

ILLUSTRATION 68

COMPARATIVE FIELD PRODUCTION RECORD

Field No. 5—25 Acres

Item	Data	Year Ended Feb. 28th		
		1917	1918	1919
1	Crop or Crops Harvested	Sweet Clover	Corn	Corn
2	No. of bushels or tons harvested . .		1,109½	
3	Bu. or tons per acre (Item 2 ÷ 25) .		44.4	
4	Total Production Cost		\$285.56	
5	Production Cost per acre (Item 4 ÷ 25)		\$11.42	
6	Production Cost per bushel or ton (Item 4 ÷ Item 2)		\$.257	
7	Remarks concerning treatment of soil for the crop raised		Horse manure and sweet clover plowed under	

In the preparation of the Comparative Field Production Record, item 1 may be obtained from the farm plot; but more often it comes from the memory of the farmer. Item 2 is obtained from the ledger account. In this instance the 1109½ comes from Field No. 5 account of Illustration 63. Likewise item 4 comes from the same account. Items 3 and 5 are obtained by division as indicated, the divisor 25 being the number of acres in Field No. 5, as indicated

at the top of Illustrations 63 and 68. Item 6 is obtained by dividing the total production cost (item 4) by the number of bushels or tons harvested (item 2). It may be taken from the Field account, also.

A table similar to the one just described is subject to modification to suit conditions and the demands of the farmer. By comparing the Production Record of Field No. 5 with other fields in any one year or series of years, conclusions may be drawn as to the relative value of different kinds of fertilizer, rotation of crops, methods and time of plowing and other facts of interest and value.

In such a comparison the most essential elements to note are items 3, 6 and 7, as numbered in Illustration 68. The bushels or tons per acre used in connection with the facts concerning the treatment of the soil are very essential.

A very good way to study the cropping situation in general is to use the Field Production Record (Illustration 68) along with the Crop Analysis (Illustrations 64 and 66) or the Crop Production Record (Illustration 67). Such a study must be careful and thorough in order to get results that will be effective. The more one studies such tables, the more he finds to assist him in directing the policies of the farm.

Comparison of Livestock.—It has been pointed out that general policies in connection with the growing of crops on a farm may be influenced considerably through the preparation of analytical and comparative tables, all of which are prepared primarily from the ledger accounts. In a similar manner the raising of livestock may be influenced by a study of comparative results arising from the operations of two or more classes of stock over a period of two or more years.

Using the Swine account as typical of livestock, the details of an account after closing at the end of a fiscal year are presented in Illustration 69.

The figures of this Swine account are used for the Comparative Analysis which is shown in Illustration 70.

The Swine account as presented in Illustration 69 contains a credit of \$200 for swine which were lost by cholera. The debit that was made on Jan. 25, 1917, to offset this credit was placed in the Loss and Gain account. The latter account, then, contains two items relating to swine during the year. The one for \$200 on Jan. 25, 1917, indicates a loss of an extraordinary nature. The one on Feb. 28, 1917, for \$10 is the loss on general operations in swine for the year. This method of recording unusual losses in livestock is explained under "Death of Livestock," Chapter VII.

ILLUSTRATION 69

SWINE ACCOUNT CLOSED AND READY FOR ANALYSIS

Swine

1916		1916	
Mar. 1 Inventory.....	\$400.00	Dec. 22 Cash Sale.....	\$140.00
1917		1917	
Feb. 28 Feed for year..	81.00	Jan. 25 Died of cholera	200.00
Feb. 28 Labor.....	10.10	Feb. 28 Inventory.....	150.00
Feb. 28 Horse Labor...	.60	Feb. 28 Loss and Gain.	10.00
Feb. 28 Bldg. Expense..	3.00		
Feb. 28 Int. on hog lot..	4.00		
Feb. 28 Equipt. Exp...	.60		
Feb. 28 General Exp...	.70		
	<u>\$500.00</u>		<u>\$500.00</u>
1917			
Mar. 1 Inventory.....	\$150.00		

The Comparative Analysis of Swine Account presented in Illustration 70, shows the general form and contents of

ILLUSTRATION 70
COMPARATIVE ANALYSIS OF SWINE ACCOUNT

Item No.		For Year Ended Feb. 28th		
		1917	1918	1919
	<i>Cost</i>			
	Feed	\$81.00		
	Man Labor	10.10		
	Horse Labor	.60		
	Building Expense	3.00		
	Rent or interest on hog lot	4.00		
	Equipment Expense	.60		
	General Expense	.70		
(1)	Total cost of maintenance	\$100.00		
(2)	Add Inventory at beginning of year ..	400.00		
(3)	Cost of all swine handled during the year	\$500.00		
(4)	Deduct: Swine lost by death during the year	200.00		
(5)	Cost of swine available for sale or use during the year	\$300.00		
(6)	Deduct Inventory at close of year ...	150.00		
(7)	Cost of swine sold and used during the year	\$150.00		
	<i>Income</i>			
(8)	Swine sold	\$140.00		
(9)	Swine used by household	xx.xx		
(10)	Total Income	\$140.00		
	<i>Summary</i>			
(11)	Total income from swine for year ..	\$140.00		
(12)	Total cost of swine sold and used during the year (Item 7)	150.00		
(13)	Net Gain in ordinary swine opera- tions for year	-\$10.00		
(14)	Cost per cwt. of swine handled	\$10.10		
(15)	Cost per cwt. of swine sold and used ..	10.30		
(16)	Per cent of total cost of maintenance made up of feed cost	81		

a statement designed to give facts concerning a specific class of livestock. Similar statements are prepared for cattle, sheep, poultry, or horses. In any case, the data included in the Comparative Analysis would come from the ledger account of the livestock in question.

Preparation of Livestock Analysis.—By referring to Illustrations 69 and 70, it is noticed that the operations in swine resulted in a loss of \$10 from ordinary operations in addition to a \$200 loss from disease. A comparison with the preceding year or years might tend to show what caused the loss.

The preparation of the Comparative Analysis of Swine Account of Illustration 70 is taken up below in detail by items.

(1) The total cost of maintenance, \$100, is the sum of the seven amounts above it, each one of which is traceable directly to the debit side of Swine account of Illustration 69.

(2) Taken from the ledger account, being the first debit entry for the year.

(3) The sum of items (1) and (2).

(4) Taken from the credit side of the Swine account.

(5) Item (3) minus item (4).

(6) Taken from the credit side of the Swine account.

(7) Item (5) minus item (6).

(8) & (9) Taken from the credit side of the Swine account.

(10) Sum of items (8) and (9).

(11) Same as item (10).

(12) Same as item (7).

(13) Difference between items (11) and (12). In the illustration, this result is a loss rather than a gain, hence it is shown as —\$10, leaving the name of the item unchanged as “net gain in ordinary swine operations for year.”

(14) Item (3) divided by the number of cwt. of swine sold, used, buried and on hand. That is, the number of cwt. of swine removed from the drove during the year plus the cwt. (estimated) still in the drove at the end of the year, is used as a divisor. The result (\$10.10' in the case at hand is a good figure to compare with other years to indicate the relative cost of producing one hundred pounds of pork on the hoof, regardless of what the ultimate use of the animal is to be.

(15) Item (7) divided by the number of hundredweight of swine sold in the market and butchered for the household. This result when compared with a similar result in other years gives the cost per cwt. of producing the pork that results in the net gain or loss in ordinary swine operations for the year.

(16) Item (1) divided into the cost of feed and multiplied by 100. This amount, when compared with similar amounts of other years, affords a very good indication of the relative efficiency of handling the livestock. If the per cent cost of feed remains nearly uniform from year to year, any marked variation in item (14), cost per cwt. of swine handled, would tend to show the efficiency or inefficiency of management.

Analysis of Animal Products.—In the case of dairy cattle, sheep and poultry, the Comparative Analysis is prepared to show the income from the marketable products, separate from the income from the sale of the animals themselves. It is impractical to attempt to separate the costs between the animals and the product. For example, if one wishes to find the cost of producing a dozen eggs, he is confronted with a more or less theoretical problem. It involves a definite analysis of food, for example, finding out how much goes to produce the eggs and how much is consumed in maintaining the hens in a normal condition.

It is true that one can use one or two lines at the bottom

of a livestock comparative analysis page to show certain unit facts of interest concerning the products of the animals. Care should be exercised, however, in interpreting the figures so presented. If the total cost of maintaining poultry for a year is \$64 (including interest, feed, labor and all other elements of cost), and 400 dozen eggs are gathered, one should not say that it cost 16 cents ($64 \div 400$) a dozen to produce eggs. It is so common on the average farm to use or sell poultry for meat that some of the cost of \$64 is expended in an effort to keep the flock alive for other purposes than to lay eggs.

In a Comparative Analysis of Poultry, it is a good plan to show the number of dozen eggs per hen or some similar figures. Likewise, in the case of dairy cattle, the number of pounds or gallons of milk and cream per cow may be shown. The number of pounds of wool per sheep is similarly shown in the Analysis of Sheep Account. For experimental purposes a record is made of the milk or wool taken from each cow or sheep. Such a detailed procedure, naturally, is not practical on the average farm.

Accounts as a Guide to Management.—The preparation of analytical and comparative tabulations is one of the stepping stones to successful farm management. In connection with some of the tabulations on the several preceding pages, suggestions have been made as to the ways they might be interpreted in order to assist in shaping the policies of the farmer. *No attempt is made herein to state how the farmer shall remedy conditions after his attention is called to them by the accounts and analyses. A consideration of such remedies is a part of farm management.*

In general it may be stated that accounts and cost records of various sorts, including analytical tables, present facts which cause the farmer (1) to alter present methods of operation or (2) initiate new projects. This should not be interpreted as meaning that every account or cost record

prepared is to lead to some change in policy. It means, in connection with present methods, that a careful examination of the accounts and records might indicate where a change in policy or method would be desirable. It means, in connection with new projects, that great care should be exercised in inaugurating any policies without first examining and studying the accounts, records and analytical tables to see if such new policies will "pay."

Altering Present Policies.—A study of the accounts, together with the cost records, requires special training in order to read the contents intelligently. When a certain group of figures indicates some unfavorable condition, the farmer should not seek to change the conditions without bringing all correlative facts into consideration.

If the first impulse is to abandon certain operations because of the excessive cost, one must not overlook the fact that some crops or livestock are raised as auxiliary elements of the main business. As such, they really help to reduce the cost of the other main crops because they utilize labor at times when it is not needed elsewhere. If such farm elements or operations were not conducted, the cost of labor of the main crops would be increased because the laborers' total wages would be distributed over fewer productive hours. This would cause each productive hour to bear a higher rate. Accordingly the general crops would be charged with a greater amount of labor in the aggregate if it were not for the auxiliary element.

When an auxiliary crop is charged with the full hourly rate for the labor performed on it, and is also charged with all other costs, it probably shows a loss. The account of such an auxiliary crop should be analyzed and studied very carefully before the crop is discontinued as being too expensive.

Some farmers advocate charging such auxiliary crops or livestock with labor at about half price, say ten instead of

twenty cents an hour, since the labor is used on them at a time of the day or year when it could not be used very well for any other operation. This plan is undesirable. *Accounts should show the facts as they exist. Policies formed from these facts may and should be formed only after using the facts in a more or less flexible manner, in connection with one's general knowledge of the peculiarities of the business.*

A Guide in Handling Labor.—One of the biggest items of cost on a farm is labor. Man labor and horse labor constitute a considerable portion of the cost of each productive element. The exact proportion for each of the several elements varies from about one-fifth to one-half of the total cost. This proportion for each element could be reduced as indicated above, if idle time could be reduced or eliminated.

A reduction in idle time is not likely to be effected until it becomes apparent to the proprietor of a farm that idle time exists. There are graphical methods¹ showing quite vividly in any particular year, or series of years that much of the time paid for is not as productive as it should be for the employer.

Illustration 71 presents a Monthly Distribution of Labor for both men and horses for twelve successive months. It shows the number of hours worked on the average by each man and horse during each month of the year. The hours given to crop production are shown also. A valuable part of the table from the farmer's point of view is that which shows the per cent of time given to crops. From figures compiled in this way from the labor and horse labor records, one can see in what months he might arrange to have other work available for both men and horses.

The Illustration shows that the average man worked over 3000 hours during the year, while the average horse worked slightly over 1200 hours. Of the total time worked

¹ University of Missouri Research Bulletin No. 6.

ILLUSTRATION 71

MONTHLY DISTRIBUTION OF LABOR

Month	Average Hours Worked per Month		Hours Given to Crop Production		Per Cent of Time Given to Crops	
	Man	Horse	Man	Horse	Man	Horse
March.....	260.9	94.4	81.3	61.6	31.2	65.3
April.....	277.5	119.0	94.2	75.8	33.9	63.7
May.....	304.0	155.3	101.3	110.0	33.3	70.7
June.....	318.0	161.2	150.5	122.7	47.3	76.0
July.....	317.0	152.2	108.3	91.6	34.2	60.2
Aug.....	276.5	118.7	89.3	66.5	32.3	56.1
Sept.....	271.5	106.3	85.3	61.8	31.4	58.2
Oct.....	265.5	100.2	90.2	58.4	34.0	58.3
Nov.....	260.7	67.5	56.0	23.5	21.5	34.8
Dec.....	255.2	64.9	39.8	14.7	15.6	22.6
Jan.....	225.3	35.3	16.2	6.9	7.2	19.5
Feb.....	239.2	41.6	18.6	12.4	7.8	29.9
Totals.....	3271.3	1216.6	931.0	705.9	28.4	58.0

¹ University of Missouri Research Bulletin No. 6.

by man, 28.4% was on crops, while 58% of the total time worked by the average horse was spent on crops.

The monthly distribution of labor is the record that is looked upon as the starting point in any change of policy that aims to utilize the men and horses more efficiently. It shows, for instance, that only 7% to 8% of man's time in January and February is used in connection with crops; and that about 20% to 30% of horse's time is so used during the same months.

The first conclusion to be drawn from such a tabulation should be that an opportunity exists for giving the farm laborer something to do in the winter months and at cer-

tain times during the summer months. Just what the nature of the work shall be is to be decided by the farmer himself. It might mean the addition of some new productive element.

The figures under discussion in Illustration 71 are taken from four farms in Missouri engaged in diversified farming with dairying on a small scale. The total area of the four farms is 723 acres, or an average of $180\frac{3}{4}$ acres per farm. There were 23 work animals on the four farms at the time of the investigation. This indicates that there was one work animal to about every 31.4 acres of land.

It should be noted in connection with the monthly distribution of labor figures presented above that the total hours for man and horse represent the time spent on the farm in some recognized active capacity. They do not represent the average hours that might have been worked if everyone had worked full time every day. Likewise, the per cent of time given to crops means the per cent of the total time worked that was devoted to crops. For example, the table total shows that in March the average man worked 260.9 hours, 31.2% of which was spent in connection with crops. If the average man works ten hours a day on week days, and, say, four hours on Sundays, the total time for work in March would be about 280 hours, counting 26 week days and 5 Sundays. This would result in a figure showing that 29% of the total time for which the workman was paid was spent on crops.

Another point for the farmer to observe in studying such a Distribution of Labor, is that the horses are used much less efficiently than the men. Considering the total hours shown in Illustration 71, it appears that the average man worked 3271.3 hours during the year and the average horse worked 1216.6 hours. If we consider 300 working days to the year, these totals indicate that man worked 10.9 hours and horse 4 hours a day on the average. If we consider

365 working days, man worked 9 hours and the horse 3.3 hours a day. Of course, this does not imply that horses ought to work as many hours a day as a man does throughout the year.

Since the four farms in this survey under discussion practiced diversified farming with dairying on a small scale, the man labor was utilized more efficiently throughout the year than it would be on a farm engaged primarily in raising corn or wheat, without any dairying operations.

It should be made a practice by each farmer keeping labor and horse labor records, as described and illustrated in Chapter VIII on Cost Accounting, to study them carefully at the close of each year. A careful study of totals by months may lead the thoughtful farmer to find some means of using men and horses in a profitable way, during the times which are ordinarily dull.¹

Tests of Labor and Horse Labor Efficiency.—*The number of crop acres per work horse and the number of crop acres per man are two figures that should be shown at the bottom of a page used for recording the monthly distribution of labor. They serve to indicate the efficiency with which men and horses are used on a farm.*

From an investigation of 700 farms in Indiana, Illinois and Iowa² it has been found that the crop acres per work horse ranged from 9.4 acres on small farms to 32.2 acres on farms averaging nearly 1000 acres. The exact figures tabulated as a result of the investigation are given in Illustration 72. Similarly it has been determined that 75 to 80 acres per man is a reasonable allowance.

¹ For other references on the utilization of labor, see Research Bulletin No. 16, Wisconsin Agricultural Experiment Station; Bulletin No. 125, University of Missouri College of Agriculture, "Cost of Production on Missouri Farms," pages 310-315; also Bulletin No. 3 of the U. S. Dept. of Agriculture, "A Normal Day's Work for Various Farm Operations."

² Bulletin of U. S. Dept. of Agriculture, No. 41.

ILLUSTRATION 72

TABLE XX—RELATION OF THE SIZE OF THE FARM TO THE NUMBER OF CROP ACRES ON WHICH A HORSE CAN BE UTILIZED ON 700 FARMS IN INDIANA, ILLINOIS AND IOWA

Area	Farms				
	Number	Average Size (Acres)	Average Crop Area (Acres)	Average No. of Work Horses	Crop Area Per Horse (Acres)
40 acres and less.....	45	36.6	26.4	2.8	9.4
41 to 80 acres.....	114	71.4	56.7	3.6	15.7
81 to 120 acres.....	120	107.2	86.0	4.5	19.1
121 to 160 acres.....	130	149.3	122.4	5.8	21.1
161 to 200 acres.....	93	183.6	143.4	6.6	21.7
201 to 240 acres.....	75	227.4	184.9	7.8	23.7
241 to 280 acres.....	35	262.5	211.2	8.4	25.1
281 to 320 acres.....	37	305.6	233.8	9.5	24.6
321 to 400 acres.....	30	364.1	298.0	10.8	27.6
401 to 560 acres.....	12	474.8	368.6	13.1	28.1
561 to 720 acres.....	5	652.6	555.4	19.4	28.6
721 to 1,250 acres.....	4	991.2	612.0	19.0	32.2

The standard number of work units required for performing various operations on the farm has been presented in Farmers' Bulletin 661. Illustration 73 shows the work units which may be followed in determining the number of horses and men to have on a farm; or to compare with known conditions on a farm.

Miscellaneous Questions of Policy.—Aside from the handling of labor there are a number of other questions of farm management that can be settled by a careful examination of accounts and records.

The feed records and feed summary may be used in a study of the relative values of different feeds; or in other

ILLUSTRATION 73

APPROXIMATE WORK UNITS NEEDED FOR THE PRODUCTION OF
CROPS AND IN CARING FOR LIVESTOCK, ETC; A WORK UNIT
BEING A 10-HOUR DAY OF MAN OR HORSE LABOR¹

Operation	Work Units (10-Hour Day)	
	Man	Horse
² <i>Production of Crops (per acre)</i>		
Timothy, alfalfa and clover hay, per cutting.....	1	1
Oats, wheat, barley, rye, buckwheat and millet.....	2	3
Corn husked from standing stalks, Corn Belt States.....	2 to 3	5
Corn husked from shock.....	6	6
Corn for silo.....	4 to 6	5 to 7
Corn husked, Southern States.....	3 to 4	3 to 4
Potatoes.....	8 to 12	10
Cotton.....	8 to 12	4 to 6
Sugar Beets.....	7	7
Melons.....	4	2
Cabbage.....	13	12
Peanuts.....	3	1
Sorghum sown broadcast, cut for hay....	4	4
Tobacco.....	20	7
Field Beans.....	5	5
Apples.....	15	5
<i>Caring for Livestock (per year)</i>		
Horses, Corn Belt States.....	8	1/2
Horses, Eastern States.....	12	1/2
Dairy cows.....	15 to 20	1 to 2
Young stock, cattle, colts, etc.....	2 1/2 to 3	1 1/8
Ten hogs, Corn Belt States.....	10	2
Ten hogs, Eastern States.....	20	2
Ten brood sows and raising pigs to weaning.....	30	5
100 ewes.....	50	5
100 chickens (well cared for).....	15 to 25	1

¹ U. S. Dept. of Agriculture Farmers' Bulletin No. 661.

² Production in this case includes both the technical production cost and the harvesting cost.

ways connected with the general policy of finding the best ways to do things so that the greatest net income will result.

Other questions that might arise to cause one to decide whether to change present methods and policies might be enumerated as follows:

(a) Does it pay to hold a crop for a rise in price or to sell now and invest the money at a fair rate of interest?

(b) Why does barley not pay as well as potatoes?

(c) Why does wheat not pay as well as oats?

(d) Why do I not make as much on hogs as Mr. A, my neighbor?

(e) Does this field produce as much corn, oats or alfalfa per acre as that one? Why?

Without attempting to state specifically how each one of these questions might be answered, it may be said that the starting point in attempting to answer any such questions is the account or analytical table. It is true that answering questions like (a) above involves considerable guesswork. However, the point to remember in that particular case is to figure the interest on the money tied up in corn. *It is not considered necessary to charge Corn account with interest from time to time on the amount that it might sell for. Such a calculation does not need to appear in the account. It should be made as a supplementary calculation in determining the action to take when the price of the crop is known and an idea is formed as to whether the price will go up or down.*

Initiating New Projects.—At times, the farmer is confronted with propositions that cause a considerable expenditure of time and money. Sometimes the proposed change involves the abandonment of some property that is giving good service. It is upon such occasions that a good accounting system coupled with a knowledge as to how to get

the most out of it will help the farmer in making wise decisions.

Below is a list of questions which are likely to arise for consideration on the average farm:

- (a) Does it pay to have a tractor?
- (b) Does it pay to have a milking machine?
- (c) Would it pay to buy a limestone crushing machine for the community?
- (d) Would it pay to grub the stumps out of the pasture and cultivate it?
- (e) Is pasture feeding or pen feeding preferable for hogs?
- (f) Does it pay to build a shelter for farm implements?
- (g) Does it pay to have a husker shredder?
- (h) Does it pay better to pump water by hand, by wind-mill or by gas engine?
- (i) Does a motor truck pay better than freight or express method for transporting garden truck to large markets?
- (j) Does it pay to have water troughs for cattle in the barn in view of a reported 15% increase in milk production caused thereby?
- (k) Does it pay to buy a dairy barn ventilating system?
- (l) Does it pay to sell old apple trees for saw and tool handles or to burn them for fuel?
- (m) Does it pay to let a field lie fallow for a year?
- (n) Does it pay to plow under a crop of clover or sweet clover?

Such questions as those enumerated require a knowledge of local conditions, at times. In general, however, they require only a careful study of conditions as brought out by the accounts and records, a knowledge of the effect of various elements of cost, and some common sense. Before deciding on any questions like the ones noted above, one

should figure out everything possible in dollars and cents. Then he is ready for the comparison with some other results. Sometimes, however, the changes involve a weighing of money expenditure against convenience. In such cases the complete cost should be calculated before an attempt is made to decide whether such cost is sufficient or insufficient to warrant the resulting convenience or inconvenience.

The experience of others should be used whenever possible in determining the best course to follow. The U. S. Dept. of Agriculture and the Experiment Stations of most of the State Agricultural Colleges have performed valuable experiments intended to assist the farmer and save him the time and loss that are often necessary to prove certain facts. A list of some of the more helpful bulletins and books on farm management or accounts is given in the bibliography at the close of the book.

ILLUSTRATIVE PROBLEMS

1. Using the accounts of C. P. May prepared under instructions of problems 3, 4 and 5, Chapters VIII and IX, analyze the Loss and Gain account, finding the income as an individual, as a farmer, as a laborer, as a capitalist (Income from Investment), and as a manager.

2. Using the Corn account of C. P. May as kept for the three years under problems 3, 4 and 5, Chapters VIII and IX, prepare a Comparative Analysis of Corn Account for the years ended Feb. 29, 1916, Feb. 28, 1917, and Feb. 28, 1918. (See Illustration 64.) Be prepared to discuss the facts brought out by the comparison.

3. Referring again to the C. P. May accounts for the year ended Feb. 29, 1916, prepare a Comparative Analysis of Crop Accounts for the year, considering only corn, oats and wheat. (See Illustrations 64 and 66.)

4. Prepare a Comparative Corn Production and Cost Record for the three years ended Feb. 29, 1916, Feb. 28, 1917, and

Feb. 28, 1918, using the data in the C. P. May accounts referred to above. (See Illustration 67.)

5. Construct Comparative Field Production Records for C. P. May's farming operations as follows, referring to Illustration 68:

- (a) Field No. 1 for the three years.
- (b) Field No. 2 for the three years.
- (c) Field No. 4 for the three years.

6. Prepare a Comparative Analysis of Swine Account from the operations of C. P. May for the three years. (See Illustration 70.)

REVIEW QUESTIONS

1. Why is a careful scrutiny and intelligent interpretation of cost accounts desirable?
2. Compare the labor incomes of tenant and landlord operators on farms from which the Federal Department of Agriculture has collected data.
3. What average per cent profit was shown for absentee landlords in the investigation referred to in question 2?
4. Does the word cost always mean the same thing? Discuss.
5. Does the word profit always mean the same thing?
6. State three conditions that tend to govern or affect the meaning of the word profit.
7. A helpful comparison of costs or profits can be obtained only under what fundamental conditions?
8. How would you proceed to "read" from a Loss and Gain account all that is shown therein relative to the year's operations?
9. What is the starting point for all analyses and comparisons of operating results for a given period? Why?
10. Describe the preparation of the Comparative Analysis of Crop Account.
11. In studying the Comparative Analysis of Crop Account what conclusions may be drawn from variations in (a) the cost of production, (b) the cost of production per acre, (c) the cost of production per bushel, (d) the total cost

of producing and harvesting, (e) the total cost per acre, (f) the total cost per bushel, (g) the cost of the crop sold and used, (h) net gain for the year, (i) net gain per acre planted?

12. What benefits might accrue from a comparative study of the analysis of several crop accounts?
13. What are the six main parts into which a crop is divided for the purpose of preparing a Comparative Crop Production and Cost Record?
14. State the essential points to be brought out in the preparation of a Comparative Field Production Record. How can such a record be used to assist in farm management?
15. What are the essential points to be emphasized in the Comparative Analysis of a Livestock Account?
16. Considering Illustration 70, state what conclusions may be drawn from any variations in each of the items numbered (1) to (16) inclusive.
17. What difficulties are encountered in attempting to find the net cost of producing eggs or milk?
18. How may accounts be used to assist in a decision to alter present policies of management?
19. Of what use are the cost accounts and records in an attempt to handle labor and horse labor to the best advantage?
20. What data should one try to obtain in order to test the economic utilization of labor or horse labor?
21. Referring to Illustration 72, what is the average number of work horses on farms of various sizes? How many crop acres per work horse are there on the average farm in the investigation?
22. Referring to Illustration 73, what can you say as to the relative time required per acre of each of the more prominent crops? The time required for raising various kinds of livestock?
23. How may the accounts be used in helping to decide upon certain miscellaneous questions of policy? In initiating new projects?

APPENDIX

PRICES AND RATES USED ON THE FARM

Interdepartmental Transactions.—In the illustrations and problems in the foregoing chapters the prices have been given for commodities; and rates of interest arbitrarily assigned almost without exception. In practical farming operations such prices and rates must be determined in other ways for each transaction as it arises.

In transactions with outsiders, prices are fixed by market or special agreement. In transactions or adjustments between farm departments prices are determined according to logical principles of accounting and farm management.

It has been pointed out that a profit is not a profit unless every element of cost has been properly considered—that a profit on hogs when calculated by one man might have been shown as a loss under the method of accounts employed by another. A man usually deceives no one but himself if he does not show the true profits of each of his various farming operations. It is necessary, therefore, to have good logic and sound accounting principles back of all entries that affect the profits of any department.

A charge to Swine and a credit to Corn account for the feed consumed will tend to decrease the profit on swine and increase the profit on corn. A charge to Household and a credit to Cattle or Dairy Cattle for the products consumed by the family will tend to increase the profit from dairy cattle and increase the household expenses. It follows, then, that the price at which the swine are charged for feed, and the price charged to the household for dairy products will have a considerable bearing upon the financial showing of the productive elements involved.

The transactions between any of the farm elements do not

affect the profits as a farmer, however. Transactions between the household and a farm element do affect the profits as a farmer but not as an individual.

Departmental Cost Method Used.—Cost accounting on the farm is operated under the departmental system as opposed to the process, product or estimating systems. "Departmental" in this sense means a class of goods or commodities. Thus each crop and each class of livestock constitutes a department.

One department transfers property or services to another. In order to find the result of each department or productive element, it is necessary to favor no productive element; but to make all charges and credits to each one as nearly as possible on the basis they would be made if each productive element were considered as the only one on the farm. In other words all departments should be given the same consideration financially because of their juxtaposition one with another.

Such an arrangement in commercial accounting might bring up the question of inter-company profits, or it might raise the question of fictitious profits. Because of the simplicity of organization and the general nature of farming operations, no necessity arises for the elimination of inter-departmental profits in the way inter-company profits are eliminated before preparing a consolidated profit and loss and income statement of a corporation.

Fictitious Profits.—We agree with most accountants that fictitious profits should not be shown in the books of account. The method of handling interdepartmental transactions as stated above does not create fictitious profits, however. Fictitious profits are those which show the business as making a paper profit. A paper profit is one that has not resulted from a corresponding increase of resources or decrease of liabilities through transactions with outside parties.

Charging corn to the swine at market price, for example, does not create a fictitious profit because the profits of the business are not increased as a result of the entry. It is true that the Corn account is credited with a sale at selling price before the product leaves the premises. If the inventory of

corn at the close of the year were credited to the Corn account at selling price, such an entry would result in a paper profit. The difference in effect between the two credits named is in the offsetting debit. In the case of the "sale" of corn to the swine, the offsetting debit to Swine account is one which increases the cost (decreases the profit) from swine. This leaves the net farm profit the same as if the corn were fed at any other price. In the case of the corn inventory entry at selling price, the offsetting debit is recorded as a charge against the operations of the next year. This inflates the profits in corn of the current year without causing a decrease in the profits of any other farm element. As a result the net profit of the farm is inflated.

Fictitious profits are not created, then, as a result of transferring commodities from one department of the farm to another, no matter what prices are used. Fictitious profits are created by placing prices above cost price on any property for inventory purposes.

Pricing Inventories.—It is hardly necessary to state any more principles concerning the pricing of property for inventory purposes, if one could apply the statement in the preceding paragraph to all forms of property, without any further assistance. The statement that "inventories should be recorded in the books of account at cost or market price, whichever is lower," is a very common one in commercial accounting. Such a policy of pricing inventory should be practiced in every department of the farm.

The tendency to overvalue property for inventory purposes does not arise in the case of buildings or equipment, since the percentage method is used in these types of property. In placing a fair value on livestock, the various products (grains and feed), household furnishings and miscellaneous supplies, however, there is usually more of an inclination toward overvaluation.

A few brief principles may be stated for pricing inventories of each of the classes of property mentioned.

Livestock: It is quite impossible to find the cost of raising the various animals up to a given age. Accordingly the in-

ventory price can be determined more easily by estimating downward from the market price. For example, the first time a colt or calf is inventoried it should be shown at approximately 10% below its selling price at that time. The same principle should be followed in each subsequent year. After any given animal is full-grown, it should be inventoried at the same unit value each year.

Products: Grain and feed should be inventoried at cost price. This is determined from the Crop account in any specific instance under a cost system as described in Operation of Crop Account, Chapter IX. When the cost price of grain and feed is not available, inventory such products at approximately 10% below a fair average market price for the several months preceding the day on which the inventory is recorded. Using such an average market price tends to minimize the effect of any exceptionally high or low prices that might exist on the inventory date.

Miscellaneous Supplies: Cement, nails, barbed wire, axle grease and other commodities commonly listed under miscellaneous supplies inventory usually have a known unit cost price available. Such cost price should be used in pricing the portions of the commodities on hand when taking an inventory.

Household Furnishings: The simplest way of inventorying the articles in the house is to place a reasonable nominal value on the entire lot of furnishings, say \$500, \$600, or some other round amount, and use the same amount from year to year. The amount used should be about 25% less than the aggregate cost at time of first appraisal for inventory of all household furniture, carpets, rugs, pictures, clothing, jewelry, dishes and kitchen utensils. After such appraisal, any subsequent purchases of any of the articles named above should be charged to the Household account, but should not increase or decrease the inventory figure. This last statement is subject to modification only in case the general scale of household furnishings is raised materially as a result of a marked refurnishing of the house with substantially better articles.

The object in advocating such a simple but apparently un-

scientific way of treating the household inventory is based on three essential principles or facts:

1. The inventory valuation of household furnishings does not affect the profits of the farm nor any comparisons made among the farm elements. This means that the simplest method may be used without impairing the efficiency of the accounts through the apparently unscientific or inaccurate treatment.

2. It is not necessary to calculate depreciation on household furnishings. Such a calculation and entry therefrom would affect no other account. It would mean merely a debit and credit to Household account. Consequently the same purpose is served by leaving the inventory entry the same from year to year. The household receives approximately the same benefit from the furnishings each year.

3. The total furnishings of all descriptions as enumerated are maintained at about 75% of their efficiency over a period of years. Replacements from time to time tend to offset dishes, clothes, carpets, etc., that have been discarded as useless. When such replacements are charged to the Household account from year to year without being credited in the closing inventory, the result is an annual cost of operating the household which may usually be considered reasonable. Such costs of replacement take the place from time to time of charges that might be made for depreciation. Seventy-five per cent efficiency as used above does not mean that the furnishings could be sold for 75% of their cost value. Second-hand furnishings could seldom be sold for that much. That per cent represents their value in use to the farmer's family.

Pricing Commodities Fed to Livestock.—Under Fictitious Profits it was stated that the net profits of the farm as a whole are not affected by the price at which commodities are transferred from one department to another. As a result of this fact it was pointed out that a transfer of feed to livestock at market price or more would not create a fictitious profit for the farm.

There remains to be determined just what price should be

used in calculating the values of the several crops fed to livestock; and why such price should be used.

Market price of the crops fed has been found, after careful analysis, to be the price that results in showing the facts to the best advantage, both relatively and absolutely. By market price is meant the average market price during a month. As brought out in the description of the Feed Record in Chapter VIII, the quantities of the various grains and other feed consumed by livestock are ascertained by estimate or actual measurement. At the close of each month the average market price of the grain or feed is determined by a perusal of the market quotations of the papers. Such market price is used in calculating the total values for the feed record at the close of the month (See Illustrations 49 and 50).

There are several factors that cause us to conclude that market price is the most reasonable one to use in crediting the crop and debiting the livestock accounts with the commodities fed on the farm. Most of the reasons are presented on a comparative basis with the idea of showing why market price is better than cost or than market price minus cost of marketing. These latter two bases are the only other ones that seem to have any supporters. The reasons are divided into two main classes, for (A) Livestock kept for profit, and (B) Livestock kept for work, as horses.

(A) Livestock Kept for Profit.—The statement that it “pays better” to feed corn to hogs than to sell it means that the farm profit is greater, when taking all results of farming operations together. This cannot be construed as meaning that corn is responsible for the increased profits. The increased profits come as a result of the additional capital, labor and risk required to keep a drove of hogs, in addition to the raising of the corn crop.

The three principal reasons for using market price in valuing the crops fed to livestock that is kept for profit may be stated as in (1), (2) and (3) below:

(1) It permits of a comparison of costs of raising livestock on different farms in the same year.

Unit costs of production of crops are influenced so largely

by weather conditions that livestock costs in different localities would be greatly influenced by crop failures, if cost price were used. Cost of marketing is not at all uniform throughout a state, county or even smaller area. The cash market price is uniform throughout a very large area. Accordingly, a charge of market price to livestock for feed consumed affords a uniform element of cost in livestock of a given class. A comparison of other costs of producing the livestock would then tend to indicate to some extent the degree of efficiency in management.

Of course, it may be said against the market price, in this respect, that it does not afford a good basis for comparison of costs of raising a given class of livestock in two or more successive years on the same farm. This is because of the fluctuation of market price of feeds from year to year. However, the same objection may be made to the cost price, since the cost per bushel of raising a crop may vary greatly from year to year.

(2) Using market price permits the crop account to show a profit commensurate with its nearness to market regardless of whether it is all fed or all sold, or part fed and part sold. If cost price were used, and the crop were all fed, it would appear that no profit was made on the crop.

(3) Market price gives both the crop and the livestock elements the same advantage because of their juxtaposition on the farm.

As a hypothetical case, assume that a 70-cents per bushel market price of corn is made of the following parts:¹

Cost of producing and harvesting.....	\$.55
Cost of marketing.....	.05
Net profit on the crop.....	.10
Market price per bushel.....	<u>\$.70</u>

What becomes of the corn when it is sold? The grain dealer uses it to make a profit for himself. This additional profit

¹ These figures are taken merely for illustrative purposes and should not be considered indicative of what the figures ought to be under normal conditions in practice.

does not benefit the farmer in the least. All that he gets is the 10 cents net profit as shown in the analysis above. When he sells it to "Mr. Hog" instead of to the elevator man, he still gets his 10 cents net profit by selling it at market price minus the cost of marketing, 5 cents. In other words he can sell it to "Mr. Hog" at 65 cents a bushel and still make 10 cents net profit on the corn because of the saving of the 5 cents for cost of marketing.

He prefers, perhaps, to sell it to "Mr. Hog" because in selling to the elevator man he has no opportunity of deriving a benefit from the subsequent transactions in which his corn is interested. When he sells it to "Mr. Hog," he as a beneficiary expects to receive any profits that may accrue as a result of "Mr. Hog's" subsequent transactions with the corn.

Thus, by paying 65 cents (market price minus cost of marketing) "Mr. Hog" allows the farmer just as great a profit on the corn as does the elevator man. In addition, he allows the farmer the benefit of profits resulting from subsequent use of the corn.

Assume, on the other hand, a rather extreme case, that the farmer raises hogs, but buys all his feed on the market—say corn only, for the sake of simplicity. In this case the hogs are charged with market price¹ plus the cost of bringing the corn from market. This is approximately equivalent to market price plus the cost of marketing or 75 cents (70 plus 5).

From the foregoing statements it is apparent that 10 cents a bushel more is charged to hogs for feed when it is bought on the market than when it is bought from the corn crib at market price minus the cost of marketing. In other words, while the corn is not benefited at all the hogs are benefited ten cents a bushel when corn is fed at market price minus cost of marketing (65 cents in this case).

Is this fair and reasonable that one productive element should receive all the benefit from the juxtaposition of two

¹ In this case the market price is not quite the same as when the farmer sells the product. The term as used here includes a slight profit for the dealer. This is ignored in the theoretical case at hand, however.

or more elements that can and should coöperate for their mutual benefit? We think not, as long as each element in question is operated with the view of making as much profit as possible.

As stated previously, it makes no difference financially with the farmer whether this apparent favoritism exists or not. He should be interested, however, in seeing each element dealt with fairly.

A charge of the corn to the hogs at market price is the way to relieve the apparent favoritism referred to above. It also results in an even distribution of the advantage arising to each productive element because of its juxtaposition to the other. This is analyzed in the four possible cases below:

(a) *If corn is sold on the market at market price it brings 65 cents (70 minus 5 for marketing), to be used in paying the cost of 55 cents, leaving 10 cents net profit.*

(b) *If corn is sold to the hogs at market price it brings 70 cents (there being no cost of marketing), to be used in paying the cost of 55 cents, leaving 15 cents net profit.*

(c) *If the hogs buy corn on the market at market price, they pay 75 cents (70 plus 5 for bringing from market).*

(d) *If the hogs buy corn from the corn crib on the farm at market price, they pay 70 cents (there being no cost of bringing from market).*

By comparing (a) and (b) above, it is seen that corn makes 5 cents a bushel more by selling at market price to the hogs rather than on the market.

By comparing (c) and (d) above, it is seen that the hogs save 5 cents a bushel by buying at market price from the corn crib on the farm rather than on the market.

Conclusions:¹ Conditions in other classes of productive live-

¹The conclusions drawn ignore any element of storage of grain on the farm. It might be said that the crop should be credited with more than market price because it is charged with building expense; also that the crop might be sold, thus bringing in cash that could draw interest. Such a statement does not have much weight in a discussion of this sort, because market conditions are so uncertain that the crop might have been held anyway.

stock and farm crops are such as to make them applicable to the conditions cited for hogs and corn. Therefore, livestock raised for profit should be charged with farm crops consumed at market price in order to apportion fairly the advantages caused by the juxtaposition of the productive elements on the farm.

(B) **Livestock Kept for Work.**—In crediting the several crop accounts and debiting work horses with the commodities fed, market price of the commodities should be used. Thus, it might be stated that all entries for the quantities shown in the feed record should be calculated at the market price of the crops concerned, regardless of whether they are fed to livestock kept for profit or for work.

The only reason for treating the two classes of livestock separate in this discussion is that different principles govern the use of market price in the two cases.

In the case of horses, market price for feed is supported by the first two reasons given under "Livestock Kept for Profit" above, namely, to permit a comparison of results with other farms with respect to the livestock and the crop. The third reason named, that of sharing the effect of the juxtaposition of the elements on the farm, does not necessarily apply as between the horses and the crops fed. It does apply, however, as between the crops that are fed to horses and the crops that are not.

For work horses, a third reason for using market price for feed is based on the fact that some crops that get the benefit of horse labor do not contribute anything to the upkeep of the horses. If cost price were used in valuing the crops fed to horses the cost of keeping horses would be less than if market price were used. Accordingly, the cost of horse labor to be charged to the farm elements would be less. Such condition would permit the wheat, barley or other crops not usually fed to horses to share in the benefits of the cheaper horse labor without contributing anything to make such labor cheaper.

If, on a given farm, only one crop were raised, it would not make any difference in its net profit whether it was fed

at cost or market price, provided any feed purchased was charged at the same price under each of the two methods.

In order to present the effect of feeding horses at cost and market price of farm crops, four assumptions are made under the headings, Case I (a), Case I (b), Case II (a) and Case II (b) respectively, all of which are shown in Illustration 74.

Case I considers that corn is the only crop on the farm. Under (a) it is fed to horses at cost price. Under (b) it is fed at market price.

Case II considers that corn, hay and wheat are raised on the farm, corn and hay being fed to horses while wheat is not. Under (a) corn and hay are fed at cost price. Under (b) they are fed at market price.

For purposes of comparison it is assumed that market price of both corn and hay is 50% over cost price, that when three crops are raised the horse labor and other expenses are divided equally among them, that horses work only on crops, and that the market price of each of the three products raised is the same. Inventories of both the horses and crops are ignored. None of the assumptions named affect the conclusions. They are made only for the purpose of simplifying the comparison. A possible exception is the assumption that horses work only on the crops. This assumption tends to decrease the profit relatively as compared with the profit under normal conditions.

From an examination of the accounts and Summary of Illustration 74, it may be seen that when only one crop is raised on a farm and it is all fed to horses the net gain on that crop is the same whether it is fed to the horses at cost or market price. Thus, Corn shows a gain of \$440 under either method, as shown in the Summary of Results and in the account under Cases I (a) and I (b).

It is seen in Case II (a) that the wheat crop is benefited considerably to the detriment of corn and hay when the latter crops are fed at cost price and all other conditions are equal. Under this case Corn and Hay each show a net gain for the year of \$166.67, while Wheat shows \$216.66.

In Case II (b) when corn and hay are fed at market price, they return the same net gain that wheat does, \$183.35 in each

ILLUSTRATION 74

COMPARATIVE EFFECT ON NET PROFITS OF CROPS WHEN THEY
ARE FED TO HORSES AT COST AND AT MARKET PRICE

CASE I (a)

CORN THE ONLY CROP RAISED ON THE FARM
CHARGED TO HORSES AT COST PRICE

Horses

Corn fed at cost.....	\$100.00	Horse Labor cost, to	
Other feed at market..	210.00	Corn.....	\$460.00
Other upkeep expenses.	150.00		
	<u>\$460.00</u>		<u>\$460.00</u>

Corn

Horse Labor.....	\$460.00	Fed to horses at cost..	\$100.00
Other expenses of pro- duction, harvesting, etc.....	800.00	Sold or fed to other an- imals at market price	1,600.00
Net gain for year.....	440.00		
	<u>\$1,700.00</u>		<u>\$1,700.00</u>

ILLUSTRATION 74—(Continued)

CASE I (b)

CORN THE ONLY CROP RAISED ON THE FARM
CHARGED TO HORSES AT MARKET PRICE*Horses*

Corn fed at market... \$150.00	Horse Labor cost, to
Other feed at market.. 210.00	Corn..... \$510.00
Other upkeep expenses. 150.00	
<u>\$510.00</u>	<u>\$510.00</u>

Corn

Horse Labor..... \$510.00	Fed to horses at mar-
Other expenses of pro-	ket price..... \$150.00
duction, harvesting,	Sold or fed to other an-
etc..... 800.00	imals at market price 1,600.00
Net gain for year..... 440.00	
<u>\$1,750.00</u>	<u>\$1,750.00</u>

ILLUSTRATION 74—(Continued)

CASE II (a)

CORN, HAY AND WHEAT RAISED ON THE FARM

CORN AND HAY CHARGED TO HORSES AT COST PRICE; WHEAT
NOT FED, BUT SOLD*Horses*

Corn fed at cost	\$100.00	Horse Labor cost, to	
Hay fed at Cost	100.00	Corn	\$153.33
Mill feed at market . . .	110.00	Hay	153.33
Other upkeep expenses . .	150.00	Wheat	153.34
	<u>\$460.00</u>		<u>\$460.00</u>

Corn

Horse Labor	\$153.33	Fed to horses at cost	\$100.00
Other expenses of pro- duction, harvesting, etc	250.00	Sold or fed to other an- imals at market price	470.00
Net gain for year	166.67		
	<u>\$570.00</u>		<u>\$570.00</u>

Hay

Horse Labor	\$153.33	Fed to horses at cost . .	\$100.00
Other expenses of pro- duction, harvesting, etc	250.00	Sold or fed to other an- imals at market price	470.00
Net gain for year	166.67		
	<u>\$570.00</u>		<u>\$570.00</u>

Wheat

Horse Labor	\$153.34	Sold at market price . .	\$620.00
Other expenses of pro- duction, harvesting, etc	250.00		
Net Gain for the year . .	216.66		
	<u>\$620.00</u>		<u>\$620.00</u>

ILLUSTRATION 74—(Continued)

CASE II (b)

CORN, HAY AND WHEAT RAISED ON THE FARM

CORN AND HAY CHARGED TO HORSES AT MARKET PRICE; WHEAT
NOT FED, BUT SOLD

Horses

Corn fed at market price	\$150.00	Horse Labor cost to	
Hay fed at market price	150.00	Corn.....	\$186.67
Mill feed at market price	110.00	Hay.....	186.67
Other upkeep expenses	150.00	Wheat.....	186.66
	<u>\$560.00</u>		<u>\$560.00</u>

Corn

Horse Labor.....	\$186.67	Fed to horses at mar-	
Other expenses of pro-		ket price.....	\$150.00
duction, harvesting,		Sold or fed to other an-	
etc.....	250.00	imals at market price	470.00
Net Gain for year.....	183.33		
	<u>\$620.00</u>		<u>\$620.00</u>

Hay

Horse Labor.....	\$186.67	Fed to horses at mar-	
Other expenses of pro-		ket price.....	\$150.00
duction, harvesting,		Sold or fed to other an-	
etc.....	250.00	imals at market price	470.00
Net gain for year.....	183.33		
	<u>\$620.00</u>		<u>\$620.00</u>

Wheat

Horse Labor.....	\$186.66	Sold at market price..	\$620.00
Other expenses of pro-			
duction, harvesting,			
etc.....	250.00		
Net gain.....	183.34		
	<u>\$620.00</u>		<u>\$620.00</u>

ILLUSTRATION 74—(Continued)

SUMMARY OF RESULTS

Crop	Net Gain for Year			
	Case I (a) (at Cost)	Case I (b) (at Market)	Case II (a) (at Cost)	Case II (b) (at Market)
Corn.....	\$440.00	\$440.00	\$166.67	\$183.33
Hay.....			166.67	183.33
Wheat.....			216.66	183.34
Total.....	\$440.00	\$440.00	\$550.00	\$550.00

case. In other words they are not made to pay for the cheap horse labor performed on the wheat.

Conclusion: Farm crops fed to work animals should be charged at market price during the month in which they are fed.

Pricing Farm Products Consumed by Household.—Milk, eggs, mutton, beef, pork or other products consumed by the household should be charged at market price less cost of marketing. In this case, there does not arise the question of treating fairly the productive elements on the farm. As long as the productive elements are able to transfer commodities to the household at prices which will result in the same gain as when sold on the market, they are receiving fair accounting treatment.

Under the method suggested in Chapter IX, the Household is charged with milk and eggs produced, at market price less cost of marketing. If the household sells any of the eggs or milk in the market it would, then, make a profit equivalent to the cost of marketing, if it were not for the fact that the household is charged with the man and horse labor, and equipment used when a man and team goes to town in the interests of the household. According to this plan, the household does not make a profit on the farm products sold. The charge at time of milking or gathering eggs is supplemented later by a

charge for marketing. The sum of the two charges is sufficient to balance the credit for the sale at market price.

The poultry or cattle receive the same net gain when transferred to the household at market price less cost of marketing that they would if their products were sold elsewhere at market price, but the cost of marketing was debited to the poultry or cattle accounts.

When the garden is treated as in Chapter IX, the question of prices for garden truck does not arise.

Rate of Interest on Investment.—A rate of 4% a year is suggested as the most reasonable rate to use in calculating interest on investment in land. It is the most reasonable (1), because it permits a fair rate of return on capital for so stable an investment, and (2), because it is a rate which will result in a fair comparison of results of the farms operated by owners and those operated by tenants.

Considering the first reason mentioned, 5% or 6% are more often quoted as the rates of return one could expect if he invested his money elsewhere than in a farm. One might add that, if the farmer wished, he could sell his farm and invest his money in 2½% government bonds or in the postal savings bank, either of which is considered as a standard of safety in investment; or he might invest in 10% stock of a corporation, whose dividends in the future are somewhat uncertain, and the value of whose property is questionable.

In determining the rate to charge for investment in land, one should consider the rate of interest that could be obtained if the farmer were to sell his property and invest in something equally safe. The most logical investment to consider equally safe, is another farm in the same vicinity. Stating the proposition in another way, then, the rate of interest to be charged by the owner should be the same as the rate of interest he would receive from his farm, if he were to move away and rent it to someone else. Four per cent is fairly well established by investigation¹ as being nearest to the net annual rate of return which the average farmer does receive on his farm when he rents it to a tenant.

¹ U. S. Department of Agriculture Bulletin No. 41,

If a landlord farmer charges 6% on his investment, and his neighbor tenant charges rent, which amounts to 4% or slightly less, on the farm investment, it is quite obvious that the cost of production on the farm operated by the landlord would be greater than on an adjoining farm operated by a tenant. This would be the result in spite of the fact that the two farms were of equal fertility and had similar topography; and that the two men were using the same methods and principles of farming.

This explains the second reason stated for using 4% as the basis for charging interest on investment. Comparisons are very valuable. An intelligent comparison of results between farms operated by landlords and those operated by tenants would not be possible unless the charges for interest in the one case were reduced to the same basis as the charges for rent in the other case.

This principle of equality in interest and rent charges is recognized by some writers of agricultural bulletins who consider the 6% interest rate as being standard and, therefore, in the case of tenant farms, advocate an increase in the charge to the fields for rent up to such a figure as will correspond to 6% on the investment. This method attempts to make the known quantity (rent) agree with the apparently unknown quantity (interest). As stated above, rent is a known quantity, because experience shows that over a large area the return to the landlord in the shape of rent amounts to about 4% on his investment.

It is also maintained, in support of the 6% rate, that farming has risks, and that any lower rate would not compensate for the risks involved. This statement confuses the term "risk in operation" with "risk in ownership." There are undoubtedly risks in the operation of a farm, due to weather and market conditions. The risk in ownership of farm land rented on a cash basis is very slight, since the income is certain and the land value unlikely to diminish. It is this slight risk for which the absentee landlord is compensated in the form of rent. It is this risk for which the operating landlord should be compensated in the form of interest on invest-

ment. Whatever he makes above this 4% is to compensate him for his risk in operation as well as for his ability as a manager. Such risk of operation and managing ability should receive a just reward in the way of profit. Such profit would be the result of the year's operations after charging 4% interest on capital as part of the cost of production.

In order to have one rate applicable to all property on the farm, the 4% rate is used, also, in connection with buildings, equipment and livestock. These cannot be supported logically as being properly considered at 4%, since "risk in operation" and "risk in ownership" are almost synonymous. However, a charge to Building Expense, Equipment Expense or an appropriate livestock account for insurance premiums tends to offset the "risk in ownership" in many instances.

Calculation of Wages.—A Labor and Horse Labor Conversion table is given in Illustration 75 to assist in calculating wages. It is especially valuable in figuring the value of labor or horse labor spent on various farm enterprises. By the use of the Labor and Horse Labor Conversion table one can readily find the values that correspond to the hours shown in the yearly labor or horse labor summaries. The table is arranged for showing the value when the rate of labor per hour and the number of hours are known. Any rate from 8 cents to 30 cents inclusive may be used from this table. Any number of hours may be used directly or indirectly. The table shows the specific amounts for each hourly rate and for the hours 1 to 10 inclusive; and all multiples of ten up to and including 500 hours. From these figures the value of labor for almost any number of hours may be derived.

The conversion table is used in the same way for both man and horse labor. As a rule the horse labor calculations use the lower and the man labor the higher hourly rates.

Assume that the yearly labor summary shows that the total time spent in Field No. 1 for the year is 450 hours, and it is determined that the cost of labor for the year is 22 cents an hour.¹ The value of the labor to charge to Field No. 1 account under such conditions is found to be \$99. This result is ob-

¹See "Hourly Cost of Labor," Chapter VIII.

ILLUSTRATION 75

LABOR AND HORSE LABOR CONVERSION TABLE

Hours	Rate Per Hour in Cents										
	8	9	10	11	12	13	14	15	16	17	18
1	.08	.09	.10	.11	.12	.13	.14	.15	.16	.17	.18
2	.16	.18	.20	.22	.24	.26	.28	.30	.32	.34	.36
3	.24	.27	.30	.33	.36	.39	.42	.45	.48	.51	.54
4	.32	.36	.40	.44	.48	.52	.56	.60	.64	.68	.72
5	.40	.45	.50	.55	.60	.65	.70	.75	.80	.85	.90
6	.48	.54	.60	.66	.72	.78	.84	.90	.96	1.02	1.08
7	.56	.63	.70	.77	.84	.91	.98	1.05	1.12	1.19	1.26
8	.64	.72	.80	.88	.96	1.04	1.12	1.20	1.28	1.36	1.44
9	.72	.81	.90	.99	1.08	1.17	1.26	1.35	1.44	1.53	1.62
10	.80	.90	1.00	1.10	1.20	1.30	1.40	1.50	1.60	1.70	1.80
20	1.60	1.80	2.00	2.20	2.40	2.60	2.80	3.00	3.20	3.40	3.60
30	2.40	2.70	3.00	3.30	3.60	3.90	4.20	4.50	4.80	5.10	5.40
40	3.20	3.60	4.00	4.40	4.80	5.20	5.60	6.00	6.40	6.80	7.20
50	4.00	4.50	5.00	5.50	6.00	6.50	7.00	7.50	8.00	8.50	9.00
60	4.80	5.40	6.00	6.60	7.20	7.80	8.40	9.00	9.60	10.20	10.80
70	5.60	6.30	7.00	7.70	8.40	9.10	9.80	10.50	11.20	11.90	12.60
80	6.40	7.20	8.00	8.80	9.60	10.40	11.20	12.00	12.80	13.60	14.40
90	7.20	8.10	9.00	9.90	10.80	11.70	12.60	13.50	14.40	15.30	16.20
100	8.00	9.00	10.00	11.00	12.00	13.00	14.00	15.00	16.00	17.00	18.00
110	8.80	9.90	11.00	12.10	13.20	14.30	15.40	16.50	17.60	18.70	19.80
120	9.60	10.80	12.00	13.20	14.40	15.60	16.80	18.00	19.20	20.40	21.60
130	10.40	11.70	13.00	14.30	15.60	16.90	18.20	19.50	20.80	22.10	23.40
140	11.20	12.60	14.00	15.40	16.80	18.20	19.60	21.00	22.40	23.80	25.20
150	12.00	13.50	15.00	16.50	18.00	19.50	21.00	22.50	24.00	25.50	27.00
160	12.80	14.40	16.00	17.60	19.20	20.80	22.40	24.00	25.60	27.20	28.80
170	13.60	15.30	17.00	18.70	20.40	22.10	23.80	25.50	27.20	28.90	30.60
180	14.40	16.20	18.00	19.80	21.60	23.40	25.20	27.00	28.80	30.60	32.40
190	15.20	17.10	19.00	20.90	22.80	24.70	26.60	28.50	30.40	32.30	34.20
200	16.00	18.00	20.00	22.00	24.00	26.00	28.00	30.00	32.00	34.00	36.00
210	16.80	18.90	21.00	23.10	25.20	27.30	29.40	31.50	33.60	35.70	37.80
220	17.60	19.80	22.00	24.20	26.40	28.60	30.80	33.00	35.20	37.40	39.60
230	18.40	20.70	23.00	25.30	27.60	29.90	32.20	34.50	36.80	39.10	41.40
240	19.20	21.60	24.00	26.40	28.80	31.20	33.60	36.00	38.40	40.80	43.20
250	20.00	22.50	25.00	27.50	30.00	32.50	35.00	37.50	40.00	42.50	45.00
260	20.80	23.40	26.00	28.60	31.20	33.80	36.40	39.00	41.60	44.20	46.80
270	21.60	24.30	27.00	29.70	32.40	35.10	37.80	40.50	43.20	45.90	48.60
280	22.40	25.20	28.00	30.80	33.60	36.40	39.20	42.00	44.80	47.60	50.40
290	23.20	26.10	29.00	31.90	34.80	37.70	40.60	43.50	46.40	49.30	52.20
300	24.00	27.00	30.00	33.00	36.00	39.00	42.00	45.00	48.00	51.00	54.00
310	24.80	27.90	31.00	34.10	37.20	40.30	43.40	46.50	49.60	52.70	55.80
320	25.60	28.80	32.00	35.20	38.40	41.60	44.80	48.00	51.20	54.40	57.60
330	26.40	29.70	33.00	36.30	39.60	42.90	46.20	49.50	52.80	56.10	59.40
340	27.20	30.60	34.00	37.40	40.80	44.20	47.60	51.00	54.40	57.80	61.20
350	28.00	31.50	35.00	38.50	42.00	45.50	49.00	52.50	56.00	59.50	63.00
360	28.80	32.40	36.00	39.60	43.20	46.80	50.40	54.00	57.60	61.20	64.80
370	29.60	33.30	37.00	40.70	44.40	48.10	51.80	55.50	59.20	62.90	66.60
380	30.40	34.20	38.00	41.80	45.60	49.40	53.20	57.00	60.80	64.60	68.40
390	31.20	35.10	39.00	42.90	46.80	50.70	54.60	58.50	62.40	66.30	70.20
400	32.00	36.00	40.00	44.00	48.00	52.00	56.00	60.00	64.00	68.00	72.00
410	32.80	36.90	41.00	45.10	49.20	53.30	57.40	61.50	65.60	69.70	73.80
420	33.60	37.80	42.00	46.20	50.40	54.60	58.80	63.00	67.20	71.40	75.60
430	34.40	38.70	43.00	47.30	51.60	55.90	60.20	64.50	68.80	73.10	77.40
440	35.20	39.60	44.00	48.40	52.80	57.20	61.60	66.00	70.40	74.80	79.20
450	36.00	40.50	45.00	49.50	54.00	58.50	63.00	67.50	72.00	76.50	81.00
460	36.80	41.40	46.00	50.60	55.20	59.80	64.40	69.00	73.60	78.20	82.80
470	37.60	42.30	47.00	51.70	56.40	61.10	65.80	70.50	75.20	79.90	84.60
480	38.40	43.20	48.00	52.80	57.60	62.40	67.20	72.00	76.80	81.60	86.40
490	39.20	44.10	49.00	53.90	58.80	63.70	68.60	73.50	78.40	83.30	88.20
500	40.00	45.00	50.00	55.00	60.00	65.00	70.00	75.00	80.00	85.00	90.00

ILLUSTRATION 75—Continued

LABOR AND HORSE LABOR CONVERSION TABLE—Continued

Rate Per Hour in Cents

19	20	21	22	23	24	25	26	27	28	29	30
.19	.20	.21	.22	.23	.24	.25	.26	.27	.28	.29	.30
.38	.40	.42	.44	.46	.48	.50	.52	.54	.56	.58	.60
.57	.60	.63	.66	.69	.72	.75	.78	.81	.84	.87	.90
.76	.80	.84	.88	.92	.96	1.00	1.04	1.08	1.12	1.16	1.20
.95	1.00	1.05	1.10	1.15	1.20	1.25	1.30	1.35	1.40	1.45	1.50
1.14	1.20	1.26	1.32	1.38	1.44	1.50	1.56	1.62	1.68	1.74	1.80
1.33	1.40	1.47	1.54	1.61	1.68	1.75	1.82	1.89	1.96	2.03	2.10
1.52	1.60	1.68	1.76	1.84	1.92	2.00	2.08	2.16	2.24	2.32	2.40
1.71	1.80	1.89	1.98	2.07	2.16	2.25	2.34	2.43	2.52	2.61	2.70
1.90	2.00	2.10	2.20	2.30	2.40	2.50	2.60	2.70	2.80	2.90	3.00
3.80	4.00	4.20	4.40	4.60	4.80	5.00	5.20	5.40	5.60	5.80	6.00
5.70	6.00	6.30	6.60	6.90	7.20	7.50	7.80	8.10	8.40	8.70	9.00
7.60	8.00	8.40	8.80	9.20	9.60	10.00	10.40	10.80	11.20	11.60	12.00
9.50	10.00	10.50	11.00	11.50	12.00	12.50	13.00	13.50	14.00	14.50	15.00
11.40	12.00	12.60	13.20	13.80	14.40	15.00	15.60	16.20	16.80	17.40	18.00
13.30	14.00	14.70	15.40	16.10	16.80	17.50	18.20	18.90	19.60	20.30	21.00
15.20	16.00	16.80	17.60	18.40	19.20	20.00	20.80	21.60	22.40	23.20	24.00
17.10	18.00	18.90	19.80	20.70	21.60	22.50	23.40	24.30	25.20	26.10	27.00
19.00	20.00	21.00	22.00	23.00	24.00	25.00	26.00	27.00	28.00	29.00	30.00
20.90	22.00	23.10	24.20	25.30	26.40	27.50	28.60	29.70	30.80	31.90	33.00
22.80	24.00	25.20	26.40	27.60	28.80	30.00	31.20	32.40	33.60	34.80	36.00
24.70	26.00	27.30	28.60	29.90	31.20	32.50	33.80	35.10	36.40	37.70	39.00
26.60	28.00	29.40	30.80	32.20	33.60	35.00	36.40	37.80	39.20	40.60	42.00
28.50	30.00	31.50	33.00	34.50	36.00	37.50	39.00	40.50	42.00	43.50	45.00
30.40	32.00	33.60	35.20	36.80	38.40	40.00	41.60	43.20	44.80	46.40	48.00
32.30	34.00	35.70	37.40	39.10	40.80	42.50	44.20	45.90	47.60	49.30	51.00
34.20	36.00	37.80	39.60	41.40	43.20	45.00	46.80	48.60	50.40	52.20	54.00
36.10	38.00	39.90	41.80	43.70	45.60	47.50	49.40	51.30	53.20	55.10	57.00
38.00	40.00	42.00	44.00	46.00	48.00	50.00	52.00	54.00	56.00	58.00	60.00
39.90	42.00	44.10	46.20	48.30	50.40	52.50	54.60	56.70	58.80	60.90	63.00
41.80	44.00	46.20	48.40	50.60	52.80	55.00	57.20	59.40	61.60	63.80	66.00
43.70	46.00	48.30	50.60	52.90	55.20	57.50	59.80	62.10	64.40	66.70	69.00
45.60	48.00	50.40	52.80	55.20	57.60	60.00	62.40	64.80	67.20	69.60	72.00
47.50	50.00	52.50	55.00	57.50	60.00	62.50	65.00	67.50	70.00	72.50	75.00
49.40	52.00	54.60	57.20	59.80	62.40	65.00	67.60	70.20	72.80	75.40	78.00
51.30	54.00	56.70	59.40	62.10	64.80	67.50	70.20	72.90	75.60	78.30	81.00
53.20	56.00	58.80	61.60	64.40	67.20	70.00	72.80	75.60	78.40	81.20	84.00
55.10	58.00	60.90	63.80	66.70	69.60	72.50	75.40	78.30	81.20	84.10	87.00
57.00	60.00	63.00	66.00	69.00	72.00	75.00	78.00	81.00	84.00	87.00	90.00
58.90	62.00	65.10	68.20	71.30	74.40	77.50	80.60	83.70	86.80	89.90	93.00
60.80	64.00	67.20	70.40	73.60	76.80	80.00	83.20	86.40	89.60	92.80	96.00
62.70	66.00	69.30	72.60	75.90	79.20	82.50	85.80	89.10	92.40	95.70	99.00
64.60	68.00	71.40	74.80	78.20	81.60	85.00	88.40	91.80	95.20	98.60	102.00
66.50	70.00	73.50	77.00	80.50	84.00	87.50	91.00	94.50	98.00	101.50	105.00
68.40	72.00	75.60	79.20	82.80	86.40	90.00	93.60	97.20	100.80	104.40	108.00
70.30	74.00	77.70	81.40	85.10	88.80	92.50	96.20	99.90	103.60	107.30	111.00
72.20	76.00	79.80	83.60	87.40	91.20	95.00	98.80	102.60	106.40	110.20	114.00
74.10	78.00	81.90	85.80	89.70	93.60	97.50	101.40	105.30	109.20	113.10	117.00
76.00	80.00	84.00	88.00	92.00	96.00	100.00	104.00	108.00	112.00	116.00	120.00
77.90	82.00	86.10	90.20	94.30	98.40	102.50	106.60	110.70	114.80	118.90	123.00
79.80	84.00	88.20	92.40	96.60	100.80	105.00	109.20	113.40	117.60	121.80	126.00
81.70	86.00	90.30	94.60	98.90	103.20	107.50	111.80	116.10	120.40	124.70	129.00
83.60	88.00	92.40	96.80	101.20	105.60	110.00	114.40	118.80	123.20	127.60	132.00
85.50	90.00	94.50	99.00	103.50	108.00	112.50	117.00	121.50	126.00	130.50	135.00
87.40	92.00	96.60	101.20	105.80	110.40	115.00	119.60	124.20	128.80	133.40	138.00
89.30	94.00	98.70	103.40	108.10	112.80	117.50	122.20	126.90	131.60	136.30	141.00
91.20	96.00	100.80	105.60	110.40	115.20	120.00	124.80	129.60	134.40	139.20	144.00
93.10	98.00	102.90	107.80	112.70	117.60	122.50	127.40	132.30	137.20	142.10	147.00
95.00	100.00	105.00	110.00	115.00	120.00	125.00	130.00	135.00	140.00	145.00	150.00

tained by looking in the column headed \$.22 on the horizontal line opposite 450 hours. If the number of hours on Field No. 2 is 456, an additional calculation is necessary, since the table does not show a specific value for any hours between 450 and 460. In order to find the value of 456 hours at 22 cents, it is necessary to find the value of 450 hours and add to it the value of 6 hours, thus:

450 hours at 22 cents, per table	\$99.00
6 hours at 22 cents, per table	1.32
<hr/>	
456 hours at 22 cents for Field No. 2 . . .	\$100.32

For any number of hours over 500, the calculation may be obtained similarly by adding the value for 500 hours to some other value shown in the table, as the occasion demands.

Feed Record Calculations.—A feed record has very few types of product to consider as compared with the number of farm elements to be considered in a labor record. Accordingly, a Conversion table for recording values of the feed consumed by animals is not of much assistance.¹ The prices of the products vary to such an extent that such a table would be so large as to become unwieldy. A table is presented below, however, which is designed to assist in calculating the number of bushels of a product in a given number of pounds. That is, for instance, if a notation of feedings is made in pounds during a month, and it is desired to reduce the figure to bushels before applying the average market price of the product, the Feed Conversion table of Illustration 76 is used. The table can also be used in connection with the sale of any of the ordinary farm products, as it affords a quick and accurate means of finding the number of bushels in a load when the weight in pounds is given. The results are so tabulated that they can be determined with equal rapidity for a product weighing 32, 48, 56, 60 or 70 pounds to the bushel.

In the Feed Conversion Table of Illustration 76 all of the possible weights are not given in detail. A sufficient number are given, however, so that almost any weight in pounds

¹See "Feed Record," Chapter VIII.

ILLUSTRATION 76

FEED CONVERSION TABLE

(SHOWING NUMBER OF BUSHELS IN A GIVEN NUMBER OF POUNDS
OF VARIOUS PRODUCTS)

Pounds	Oats (32lbs. per bu.)		Barley (48lbs. per bu.)		Shelled Corn, Rye, Flaxseed, Etc. (56lbs. per bu.)		Wheat, Clover Seed, Beans, Peas, Potatoes (60lbs. per bu.)		Ear Corn (70 lbs. per bu.)	
	Bu.	Lbs.	Bu.	Lbs.	Bu.	Lbs.	Bu.	Lbs.	Bu.	Lbs.
1		1		1		1		1		1
2		2		2		2		2		2
4		4		4		4		4		4
6		6		6		6		6		6
8		8		8		8		8		8
10		10		10		10		10		10
20		20		20		20		20		20
30		30		30		30		30		30
40	1	8		40		40		40		40
50	1	18	1	2		50		50		50
60	1	28	1	12	1	4	1	00		60
70	2	6	1	22	1	14	1	10	1	00
80	2	16	1	32	1	24	1	20	1	10
90	2	26	1	42	1	34	1	30	1	20
100	3	4	2	4	1	44	1	40	1	30
110	3	14	2	14	1	54	1	50	1	40
120	3	24	2	24	2	8	2	00	1	50
130	4	2	2	34	2	18	2	10	1	60
140	4	12	2	44	2	28	2	20	2	00
150	4	22	3	6	2	38	2	30	2	10
160	5	00	3	16	2	48	2	40	2	20
170	5	10	3	26	3	2	2	50	2	30
180	5	20	3	36	3	12	3	00	2	40
190	5	30	3	46	3	22	3	10	2	50
200	6	8	4	8	3	32	3	20	2	60
210	6	18	4	18	3	42	3	30	3	00
220	6	28	4	28	3	52	3	40	3	10
230	7	6	4	38	4	6	3	50	3	20
240	7	16	5	00	4	16	4	00	3	30
250	7	26	5	10	4	26	4	10	3	40
260	8	4	5	20	4	36	4	20	3	50
270	8	14	5	30	4	46	4	30	3	60
280	8	24	5	40	5	00	4	40	4	00
290	9	2	6	2	5	10	4	50	4	10
300	9	12	6	12	5	20	5	00	4	20
310	9	22	6	22	5	30	5	10	4	30
320	10	00	6	32	5	40	5	20	4	40
330	10	10	6	42	5	50	5	30	4	50
340	10	20	7	4	6	4	5	40	4	60
350	10	30	7	14	6	14	5	50	5	00
360	11	8	7	24	6	24	6	00	5	10
370	11	18	7	34	6	34	6	10	5	20
380	11	28	7	44	6	44	6	20	5	30
390	12	6	8	6	6	54	6	30	5	40
400	12	16	8	16	7	8	6	40	5	50

ILLUSTRATION 76—*Continued*
FEED CONVERSION TABLE—*Continued*

Pounds	Oats (32lbs. per bu.)		Barley (48lbs. per bu.)		Shelled Corn, Rye, Flaxseed, Etc. (56lbs. per bu.)		Wheat, Clover Seed, Beans, Peas, Potatoes (60lbs. per bu.)		Ear Corn (70lbs. per bu.)	
	Bu.	Lbs.	Bu.	Lbs.	Bu.	Lbs.	Bu.	Lbs.	Bu.	Lbs.
410	12	26	8	26	7	18	6	50	5	60
420	13	4	8	36	7	28	7	00	6	00
430	13	14	8	46	7	38	7	10	6	10
440	13	24	9	8	7	48	7	20	6	20
450	14	2	9	18	8	2	7	30	6	30
460	14	12	9	28	8	12	7	40	6	40
470	14	22	9	38	8	22	7	50	6	50
480	15	00	10	00	8	32	8	00	6	60
490	15	10	10	10	8	42	8	10	7	00
500	15	20	10	20	8	52	8	20	7	10
600	18	24	12	24	10	40	10	00	8	40
700	21	28	14	28	12	28	11	40	10	00
800	25	00	16	32	14	16	13	20	11	30
900	28	4	18	36	16	4	15	00	12	60
1,000	31	8	20	40	17	48	16	40	14	20
1,100	34	12	22	44	19	36	18	20	15	50
1,200	37	16	25	00	21	24	20	00	17	10
1,300	40	20	27	4	23	12	21	40	18	40
1,400	43	24	29	8	25	00	23	20	20	00
1,500	46	28	31	12	26	44	25	00	21	30
1,600	50	00	33	16	28	32	26	40	22	60
1,700	53	4	35	20	30	20	28	20	24	20
1,800	56	8	37	24	32	8	30	00	25	50
1,900	59	12	39	28	33	52	31	40	27	10
2,000	62	16	41	32	35	40	33	20	28	40
2,100	65	20	43	36	37	28	35	00	30	00
2,200	68	24	45	40	39	16	36	40	31	30
2,300	71	28	47	44	41	4	38	20	32	60
2,400	75	00	50	00	42	48	40	00	34	20
2,500	78	4	52	4	44	36	41	40	35	50
2,600	81	8	54	8	46	24	43	20	37	10
2,700	84	12	56	12	48	12	45	00	38	40
2,800	87	16	58	16	50	00	46	40	40	00
2,900	90	20	60	20	51	44	48	20	41	30
3,000	93	24	62	24	53	32	50	00	42	60
4,000	125	00	83	16	71	24	66	40	57	10
5,000	156	8	104	8	89	16	83	20	71	30
6,000	187	16	125	00	107	8	100	00	85	50
7,000	218	24	145	40	125	00	116	40	100	00
8,000	250	00	166	32	142	48	133	20	114	20
9,000	281	8	187	24	160	40	150	00	128	40
10,000	312	16	208	16	178	32	166	40	142	60
20,000	625	00	416	32	357	8	333	20	285	50
30,000	937	16	625	00	535	40	500	00	428	40
40,000	1250	00	833	16	714	16	666	40	571	30
50,000	1562	16	1041	32	892	48	833	20	714	20
60,000	1875	00	1250	00	1071	24	1000	00	857	10
70,000	2187	16	1458	16	1250	00	1166	40	1000	00
80,000	2500	00	1666	32	1428	32	1333	20	1142	60
90,000	2812	16	1875	00	1607	8	1500	00	1285	50
100,000	3125	00	2083	16	1785	40	1666	40	1428	40

up to 100,000 can be changed to bushels by selecting the proper figure in the table or by merely adding two figures together. A few examples may tend to assist in the use of the table.

Example

It is found that 1000 pounds of ear corn have been fed to the swine during a given month, valued at \$1.10 a bushel. What is the total value?

Solution

1000 pounds of ear corn is 14 bu.¹ 20 pounds. 14 bu. 20 pounds at \$1.10 per bushel = \$15.71.

The Feed Conversion Table assists in the solution given above by supplying the 14 bu. 20 pounds as being the number of bushels of ear corn in 1000 pounds. The 14 bu. 20 pounds are found in the last column under "Ear Corn (70 lbs. per bu.)," opposite the 1000 which is in the first or "Pounds" column.

Example

The feed record shows 1200 pounds of oats fed to horses at \$.60 a bushel in November. What is the total value?

Solution

1,200 lbs. oats is 37 bu. 16 lbs.

37 bu. 16 lbs. at \$.60 per bu. = \$22.50

The Conversion Table shows that 1200 pounds of oats is equivalent to 37 bu. 16 lbs., or 37½ bu.

Example

Mr. Myers has 25,410 pounds of oats weighed for sale. How much will he receive for them at 55 cents a bushel?

¹In the feed record it is necessary to consider grain only to the nearest bushel when the total for a month or year is taken.

Solution

20,000 lbs. of oats is 625 bu.

5,000 lbs. of oats is 156 bu. 8 lbs.

410 lbs. of oats is 12 bu. 26 lbs.

25,410 lbs. of oats is 793 bu. 34 lbs.
 or 794 bu. 2 lbs.

794 bu. 2 lbs. @ 55 cents a bushel is \$436.73.

Since the Feed Conversion Table does not show directly the number of bushels in 25,410 lbs., it is necessary to add together the number of bushels in 20,000 lbs., 5000 lbs. and 410 lbs. respectively, each of which is shown in the first column of the table.

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The list is intended as a guide in collateral reading. Although many of the books and bulletins have been examined and aid secured therefrom in the preparation of this volume, the presence of a publication in the list does not necessarily mean that it has been of service to the author. Likewise a knowledge obtained from advanced books in accountancy, mathematics, law and economics has been used, but such books are not considered in the bibliography following:

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