FARM ACCOUNTS: METHODS AND PRINCIPLES

BY

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THESIS

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Oscar Ross Martin

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(Forms and Records used in Farm Cost Accounting.)
Introduction.

The object of farm accounting is to make possible the application of scientific business principles to the organization and operation of the farm.

The farm was formerly a non-trading, self-sufficing unit and the farmer a laborer who provided entirely for his own needs. The farmer of today produces for the market, he specializes in different types of farming and in different farm products, he buys and sells, he borrows capital. Stated briefly, farming has become a business enterprise.

This change has brought with it distinct problems of farm management. Higher land value means that the land must be utilized to its fullest capacity. To do this requires investments in machinery and equipment of all kinds, of which in turn the most efficient use must be made. Labor is becoming scarcer and consequently more expensive. It is a market commodity and it must be manipulated so as to bring in the largest returns. Today, to be successful and to utilize his time and energy with the greatest efficiency, the farmer must place more emphasis upon mental effort in the form of planning and organization, and relatively less emphasis upon hard manual labor.

The application of the natural sciences to agriculture has produced excellent results. We raise more and better grains, our forage crops are better adapted to the physical conditions, such as soil and climate, and our live stock has been greatly im-
proved. In the same way, it is to be hoped that as the farm becomes more business-like in character, the application of scientific business principles and methods will result in a distinct advancement.

Even though the farmer recognizes the general change taking place in the character of the farm, he still permits himself to be controlled largely in the selection and management of the different farm enterprises by intuition, by custom, and by tradition. The progressive business man does not rely upon such factors to bring him success. He has learned to appreciate the value of basing his judgment concerning the most profitable course of action upon actual and precise facts, and considers the time and energy necessary to secure and to study such facts profitably spent. The farmer must do the same.

In the selection of crops and enterprises the business and economic conditions of the community must be considered as well as the physical conditions. The business and economic conditions are constantly changing, and it is the man with the keenest foresight as well as insight who reaps the largest profit. The adjustment of the farm policy to the prevailing business and economic conditions demands that the farmer know his business accurately as a whole and in its different parts.

Thus a well-planned system of accounts is an essential part of modern farming. It must always be borne in mind, however, that the mere keeping of accounts will in itself not make a farmer successful. He must know and understand the significance of the facts presented by his accounts, and must be able to apply the
knowledge so gained in solving the many concrete problems of farm management.

The following paper represents an attempt to present the principles and practice of accounting with particular emphasis upon their application to the farm. The paper is divided into two principal parts. The first part deals with financial accounts. Both single and double entry accounting are described, but only such features are discussed as are of importance in farm accounting. A general scheme of financial accounts is presented which may easily be adapted to particular farms. The second part deals with farm cost accounting. An attempt is made to point out the relation between cost accounting and farm management. A general scheme of cost accounts has been prepared and each account is described in detail. In addition there is a discussion of accounting and economic principles involved in such a system of accounts.
Part I.
Chapter I.

A SINGLE ENTRY SYSTEM OF FARM ACCOUNTS.

DEFINITION OF ACCOUNTING.

Accounting is the science which treats of the methods of recording and of classifying business transactions, and which enables one to analyze the statements in the books and documents of a concern so that one may have a clear conception of the exact condition of the enterprise as a whole and in its parts. (1)

ACCOUNTING SYSTEM MUST BE ADJUSTED TO THE BUSINESS.

In order to be satisfactory an accounting system must be adjusted to the particular business for which it is intended. In the management of a small enterprise there is not required the same completeness of information that is necessary for the successful conduct of larger and more complex enterprises. Likewise the character of the information necessary to good management will vary with each particular business. Although an accounting system is necessarily based upon the organization of the business, at the same time it should be the means employed to point out in what respects a more efficient scheme of organization can be introduced. The value of the information secured by means of an accounting system should always be compared with the cost of securing the same, for in every enterprise, large or small, there

(1) Duncan, J.C. Principles of Accounting. (Manuscript.)
is much information which may be gathered through the accounts which will not be worth the trouble incurred.\(^1\) The best accounting system is not the most elaborate and complex, but that system, which, with the minimum amount of expense and trouble, most effectively furnishes the information necessary for the successful management of the particular enterprise.

**ACCOUNTS.**

An account may be defined as a statement of the financial facts pertaining to a person, a property, or a service classified and summarized under an appropriate heading. There are two opposing tendencies shown by financial facts, namely, increase and decrease.\(^2\) The mechanical arrangement of an account should provide for the statement of these two opposing tendencies in such a way that a conclusion can be drawn easily. This is commonly accomplished by recording the increase items and the decrease items in separate columns. One of these columns (the one to the left) is called the debit column, and the other one (the one to the right) is called the credit column. When an entry is made in the debit column the account is said to be debited, and when an entry is made in the credit column the account is said to be credited.\(^3\) The principle of debiting and crediting will be considered more fully later in connection with the different

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\(1\) Hatfield, H.R. *Modern Accounting*. p.6.


\(3\) Bentley, H.C. *The Science of Accounts*. p.16
Sprague, C.E. *The Philosophy of Accounts*. Chap. II.
kinds of accounts.

SYSTEMS OF ACCOUNTS.

There are two general systems of keeping accounts. These are known respectively as single entry and as double entry. Of these single entry is the simpler system and will be described first in its application to the farm.

GENERAL DESCRIPTION OF SINGLE ENTRY. (1)

Single entry bookkeeping has been variously defined. A comparison of the definitions shows the principal point of emphasis to be that in single entry no attempt is made to record business transactions completely. Although all the values involved in the various transactions on the farm are not carefully recorded in such a system, it may nevertheless be made to furnish much information of value to the farm proprietor or manager.

The accounts which are kept in single entry bookkeeping may vary. The simplest form is to keep accounts with persons only. In this case the only information to be secured from the books is the amount owed to the business by individual persons or firms and the amount the business owes to individual persons or firms. In addition to personal accounts there may be kept a cash account, also a record of the notes

Cole, W.M. Accounts, Their Construction and Interpretation. p.313.
Miner, Geo. W. Bookkeeping. Complete Course. Appendix A.
received from and issued to others. When it is desired to know
the condition of the business and whether there has been a
gain or a loss, a statement is prepared from information se­
cured partly from the accounts and partly from other sources.
Usually the books kept are a Day Book, a Journal, a Cash Book,
a Ledger, a Notes Receivable Record, a Notes Payable Record,
and an Inventory Record.

THE DAY BOOK - JOURNAL.

The day book and the journal are frequently kept as
one book which is then known as the day book-journal. In
this book a brief description is given of every transaction
together with a statement of the accounts to be debited or
credited and the amounts. In single entry bookkeeping, the
day book-journal is the only book of original entry. (1) It
is arranged as follows:

<table>
<thead>
<tr>
<th>Date</th>
<th>Explanation and Statement</th>
<th>Debit</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>100 bu. wheat @ 70¢</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mrs. Anderson</td>
<td>Dr. 6</td>
<td>20-</td>
<td></td>
</tr>
</tbody>
</table>

(1) All books may be divided into two classes, viz: books of
original entry and books of summary entry. Books of original
entry are those in which the transaction is first recorded as
it occurs. Books of summary entry are those to which the facts
of the transaction are later transferred for the purpose of
securing a more convenient form of record.
THE CASH BOOK.

In the cash book is recorded all cash received and all cash paid out, the cash received being entered on the left or debit side and the cash paid out being entered on the right or credit side. The debit side should always be the larger and the difference between the two sides, the balance, will represent the amount of cash on hand. The following illustration shows a convenient arrangement of the cash book:

<table>
<thead>
<tr>
<th>Date</th>
<th>Explanation of Cash</th>
<th>Debit Amount</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 15</td>
<td>Wm. Smith - Debit on acct.</td>
<td>50-</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Explanation of Cash</th>
<th>Credit Amount</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan 15</td>
<td>Wages - Dee Sanders</td>
<td>30-</td>
<td></td>
</tr>
</tbody>
</table>

THE LEDGER.

In the day book-journal all transactions are entered in chronological order. If one desires to know
at any time the status of a particular account it is obvious that the information will be very difficult to secure by a reference to the day book-journal, since the entries relating to the account may appear on many pages. For this reason another book, called the ledger, is kept, to which are transferred all debits and credits recorded in the day book-journal, with the exception of the debits and credits to cash which are transferred to the cash book. (1) In the ledger all debits and credits are grouped according to the account to which they belong. As stated before, in single entry book-keeping accounts are usually kept only with persons or firms whom the business owes or who owe the business. When others get into debt to the business the amount is entered on the debit side of their account. When they get out of debt to the business the amount is entered on the credit side of their account, which will then cause the account to balance. An account is said to balance when the amounts entered on both sides of the account are equal. When the business gets into debt to others the amount is entered on the credit side of their account, and when the business gets out of debt to others the amount is entered on the debit side of their account. The following rule may be followed for debiting and crediting personal accounts:

(1) Transferring items from a book of original entry to a book of summary entry is called "posting!"
Debit persons or firms when they get into our debt or we get out of their debt.

Credit persons or firms when we get into their debt or they get out of our debt.

In personal accounts are recorded only non-negotiable obligations to pay which are known as book accounts. Obligations to pay in the form of notes or acceptances are recorded separately. A very common form of ledger account, and which is well adapted for the farm, is as follows:

<table>
<thead>
<tr>
<th>Name of person or firm</th>
<th>Date</th>
<th>Explanation</th>
<th>Debit</th>
<th>Credit</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**NOTE RECORDS.**

Since the notes issued and received are not recorded in the personal accounts it is well to provide a separate record for them. Especially is this advisable in the case of the notes issued, as these pass out of the possession of the business. These records should show:
1. The date of the note.
2. The maker.
3. To whom payable.
4. The security.
5. The amount.
6. The interest terms.
7. Time of the note.
8. Date due.
9. Payments on interest and principal.
10. Date paid in full.

The following arrangement of this information will be found to be convenient:

<table>
<thead>
<tr>
<th>Date</th>
<th>Maker</th>
<th>To whom payable</th>
<th>Security</th>
<th>Amount</th>
<th>Interest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Date</th>
<th>Payable Time</th>
<th>Date</th>
<th>Payments</th>
<th>Int.</th>
<th>Amount</th>
<th>Date Paid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(1) Notes Receivable.
(2) Notes Payable.

**DETERMINING THE GAIN OR LOSS.**

In single entry bookkeeping it is impossible to determine from the accounts alone the loss or gain for any period. The loss or gain is ascertained by comparing the present worth (1) at the end of the period with the present

(1) By present worth is meant the interest of the proprietor in the farm. It does not include the private investments of the farmer or his interests in enterprises other than the farm.
worth at the beginning.\(^{(1)}\) If the present worth is larger at
the close than it was at the beginning the difference will
represent a gain, if less the difference will represent a
loss. A record should be kept of all withdrawals\(^{(2)}\) from the
business by the proprietor, and if the present worth is larger
at the close than at the beginning of the period the with-
drawals should be added to the difference in order to deter-
mine the real gain from the operation of the farm; if the
present worth is smaller at the close of the period than at
the beginning the withdrawals should be deducted from the
difference in order to determine the real loss or gain as the
case may be. In similar manner any additional investments in
the farm by the proprietor must be taken into account.

The present worth can be determined from a state-
ment of assets and liabilities. This statement will be made
up partly from information secured from the books and partly
from information secured by means of physical inventories.

\(^{(1)}\) Cole, W.M. Accounts, Their Construction & Interpretation. p.313.
Lisle, Geo. Accounting in Theory and Practice. p.43.

\(^{(2)}\) A definite distinction should be made by the farmer between
withdrawals which represent his wages and other withdrawals.
This can be done by keeping a Withdrawal account. This account
should be credited with the amount decided upon by the farmer
as representing the value of his wages. The credit may be made
at the end of each month or at the end of the year. The account
should be debited for all withdrawals by the proprietor for
his personal use or for the use of the household. At the end
of the year, if the account shows a debit balance, this balance
will represent a net withdrawal by the farmer; if the account
shows a credit balance, this balance will represent an addition-
al investment by the farmer.
CLASSIFICATION OF ASSETS AND LIABILITIES.

Assets may be defined as property owned by the business. (1) This property may be in the form of real estate, machinery, live stock, and the like, or it may be in the less concrete form of accounts or notes of persons which represent obligations payable to the business.

Liabilities may be defined as obligations owed by the business to others (1) such as mortgages payable, notes or accounts payable.

In order to prepare a statement of assets and liabilities, the assets, which represent the capital invested in the farm, should be classified. It will be found convenient to divide farm assets into three classes, as follows: Fixed, Working, and Current.

Fixed assets are those which are relatively permanent in character and value, such as land, buildings, machinery, and the live stock used in production.

Working assets consist of those assets which are constantly changing in character and value and which do not constitute a part of the permanent equipment of the farm, such as market crops and market live stock growing and unsold, seed, feed, fertilizer, etc..

Current assets are assets the value of which can be realized upon at any time, such as Accounts Receivable, Notes Receivable, and Cash. Current assets, in other words, are the assets which are in a form available for meeting current expenses.

One of the important problems in farm management is to determine what proportion of the capital should be invested in each of the different classes and forms of assets in order to operate the farm to the best advantage. The following classification has been prepared with a view to aiding in the solution of farm management problems, such as the one indicated, as well as to aid in the securing of an accurate physical inventory for the purpose of determining the gain or loss realized in the operation of the farm.

1. Fixed Assets.

1. Immovable.

1 Land.

.01 Natural value.
.02 Improvements.
  .001 Water facilities.
  .002 Drains.
  .003 Orchards.
  .004 Fences.
  .005 Roads.
  .006 Fertility.

2 Buildings.

.01 Dwelling.
.02 Houses for farm laborers.
.03 Farm buildings.

(1) See Card, F.W. Farm Management. p.149.
2. Movable.

.1 Mechanical Equipment.

.01 Machinery and Implements.
.001 Corn machinery.
.002 Grain machinery.
.003 Hay machinery.
.004 Dairy machinery.
.005 General crop machinery.
.006 Miscellaneous machinery and major equipment.

.02 Vehicles, Hitches, and Wagon Equipment.

.03 Harness Equipment and Stable Supplies.

.04 Tools and Miscellaneous Minor Equipment.
.001 Barn tools.
.002 Ditching tools.
.003 Fencing tools.
.004 Garden tools.
.005 General shop and repair tools.
.006 Miscellaneous.

.2 Live Stock.

.01 Teams.

.02 Live stock used in production.

II. Working Assets.

1. Market crops and market live stock growing and unsold.

2. Seed, feed, fertilizer, miscellaneous materials and supplies on hand.

III. Current Assets.

1. Notes and Accounts Receivable.

2. Cash.

RECORDING THE INVENTORY.

The inventory will be secured with more accuracy and with less difficulty in succeeding years if a permanent record is kept. This may be kept in a bound book or it may be kept on cards. In either case it should be so arranged that values can be compared from year to year. The following scheme will be found suitable if a bound book is used. (1)

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
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<tr>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

If the card system is adopted a separate card should be kept for each item in the inventory. In addition, a form should be provided for recording a summary of all the items. These cards may be ruled to suit the particular items, however, in general the following form will be found to be a convenient one:

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Remarks:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The bound book has the advantage of furnishing a more permanent record. The record is, however, inflexible, i.e. it does not easily permit of expansion or contraction without disturbing the systematic arrangement of the assets. Neither does it permit of the convenient recording of
memoranda concerning the individual items which may be both interesting and useful.

The card system is flexible and easily adjusts itself to changes in the farm assets. New cards may be inserted at any time for items when added to the equipment of the farm, or they may be taken out when items disappear from the equipment. It permits of the recording of memoranda concerning the individual items, e.g. factors responsible for rapid or slow depreciation as the case may be, improvements increasing the value of certain items, etc. On the other hand, the card system does not furnish so permanent a record as the bound book.

COMPARATIVE STATEMENT OF ASSETS AND LIABILITIES.

In order to compare the condition of the business on different dates a comparative statement of assets and liabilities may be used. By means of a comparative statement of assets and liabilities one is enabled to note the changes that have taken place in the different assets or groups of assets, also the changes in the liabilities. The difference between the total assets and total liabilities for each date will represent the present worth at that time, and by a comparison of the present worth at the two dates the gain or loss for the period may be ascertained. A comparative statement of assets and liabilities is arranged thus:-
### Statement of Assets and Liabilities and Comparison of Frank Anderson as of Jan. 1, 1912 and Jan. 1, 1913.

<table>
<thead>
<tr>
<th>Assets</th>
<th>Jan. 1, 1912</th>
<th>Jan. 1, 1913</th>
<th>Increase</th>
<th>Liabilities</th>
<th>Jan. 1, 1912</th>
<th>Jan. 1, 1913</th>
<th>Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>Land</td>
<td>7760</td>
<td>7760</td>
<td>0</td>
<td>Mortgage Pay</td>
<td>4000</td>
<td>4000</td>
<td>0</td>
</tr>
<tr>
<td>Buildings</td>
<td>2710</td>
<td>3038</td>
<td>328</td>
<td>Notice Pay</td>
<td>100</td>
<td>350</td>
<td>250</td>
</tr>
<tr>
<td>Mach. &amp; Supp.</td>
<td>298</td>
<td>30636</td>
<td>836</td>
<td>Aecte. Pay</td>
<td>25</td>
<td>40</td>
<td>15</td>
</tr>
<tr>
<td>Vehicles</td>
<td>235</td>
<td>81420</td>
<td>57920</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harvess Equip</td>
<td>178</td>
<td>11776</td>
<td>1024</td>
<td>Present Worth</td>
<td>1192635</td>
<td>1274699</td>
<td>81864</td>
</tr>
<tr>
<td>Tools</td>
<td>2275</td>
<td>3105</td>
<td>270</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Misc. Equip.</td>
<td>4850</td>
<td>4467</td>
<td>388</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Trusses</td>
<td>1975</td>
<td>177750</td>
<td>19750</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cattle</td>
<td>985</td>
<td>97250</td>
<td>9750</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hogs</td>
<td>43210</td>
<td>3350</td>
<td>8210</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Buildings</td>
<td>50</td>
<td>50</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Merc. Crops</td>
<td>1147</td>
<td>1345</td>
<td>198</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Misc. Supplies</td>
<td>2</td>
<td>2</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fertilizer</td>
<td>72</td>
<td>72</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Notice Rec.</td>
<td>465</td>
<td>400</td>
<td>65</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aecte Rec.</td>
<td>260</td>
<td>260</td>
<td>0</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cash</td>
<td>110</td>
<td>240</td>
<td>130</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Net Increase:** 108364

**Present Worth Jan. 1, 1912:** 1774499

**Present Worth Jan. 1, 1913:** 1192635

**Net Increase With Drawals:** 500

**Net Gain:** 131864

**Net Increase:** 81864
SUMMARY.

It has been pointed out above that single entry bookkeeping does not record transactions completely, but that notwithstanding that fact such a system may be made to furnish the farm manager with much information of value. It may be well at this point to review briefly the character of this information.

First, the farmer may know definitely the amount of his investment in the farm. He may also ascertain with reasonable accuracy the results of the operation of the farm with respect to the amount of the loss or the gain that has been realized. The comparative statement of assets and liabilities will enable the farmer to determine the proportion of the capital that is invested in each of the different forms of assets. Such information will be of value in securing a proper correlation of the factors of production. It is essential that the farm be neither over-equipped nor under-equipped, but that the different factors of production be so combined as to make possible the operation of the farm with the greatest efficiency.

The comparative statement of assets and liabilities also points out the changes constantly taking place in the value of the different assets and liabilities. If a profit has been realized in the operation of the farm, this profit will commonly be left as an additional investment in the farm, in which case it will be in the form of an addition to the value of particular assets. This disposition of the profit
is thus clearly shown. In similar manner, if the farm operation has resulted in a loss, this loss will be met either by a decrease in the value of particular assets or by an increase in liabilities.

A single entry accounting system will direct the attention of the farmer to certain important items of expense which are easily overlooked, as, for example, depreciation. Finally, such a system will enable the farmer to know definitely and accurately his financial relations with others.

It is well to call attention to the fact that although a single entry system indicates the loss or gain due to the operation of the farm, it does not furnish the farm manager with information concerning the real causes or sources of the loss or the gain. It merely indicates the net result. In the attempt to secure simplicity, comprehensiveness of information and accuracy in detail are sacrificed. There is also more work of a supplementary character, such as the frequent taking of physical inventories, involved in a single entry than in a system in which accounts are kept for the assets and the liabilities.
Chapter II(10,11),(987,990).

DOUBLE ENTRY BOOKKEEPING.

In contradistinction to single entry, double entry may be defined as that system of bookkeeping which aims to furnish a complete record of all the values involved in the various transactions of the business. Before proceeding to describe such a system in its application to the farm certain explanations will be necessary.

THE NATURE OF BUSINESS TRANSACTIONS.

A business transaction may be defined as an equal exchange of values. A transaction may result in certain values coming into the business and other values going out of the business, or it may mean a mere transfer of values between different departments within the business. For example:

1. A horse is sold for cash. A value comes into the business in the form of cash and a value goes out of the business in the form of the horse.

2. Corn is taken from the cornfield to be used as feed for the horses. In this case the cornfield parts with a value, namely corn, and the horses receive a value, also in the form of corn. There has been a transfer of values between different departments of the business.

THE BUSINESS EQUATION OR BALANCE SHEET.

The status of any business may be expressed in the form of an equation; thus:

Assets - Liabilities = Proprietorship,

or transposing,

Assets = Liabilities + Proprietorship,

which, for accounting purposes, is the more convenient form of statement.

A statement which shows these three sets of facts concerning a business, namely, the assets, the liabilities, and the proprietorship, is also known as a Balance Sheet. The balance sheet and the business equation, then, are identical.

THE PRINCIPLE OF DEBIT AND CREDIT.

For accounting purposes it is found most convenient to arrange the balance sheet or business equation in the form of an account. It then appears as follows:

Balance Sheet.

<table>
<thead>
<tr>
<th>Assets</th>
<th>Liabilities</th>
<th>Proprietorship</th>
</tr>
</thead>
</table>

In accordance with this plan any increase in assets will be recorded by an entry on the left or debit side, and any decrease in assets will be recorded by an entry on the right or credit side.


Sprague, C.E. The Philosophy of Accounts. Chap. V.

(3) In bookkeeping deductions are made by adding to the opposite side of the account. See page 5.
Any increase in liabilities will be recorded by an entry on the right or credit side, and any decrease in liabilities will be recorded by an entry on the left or debit side. Any increase in proprietorship will be recorded by an entry on the right or credit side, and any decrease in proprietorship will be recorded by an entry on the left or debit side. The following rules may then be formulated:

Debit assets for any increase in their value.
Credit assets for any decrease in their value.

Debit liabilities for any decrease in their value.
Credit liabilities for any increase in their value.

Debit proprietorship for any decrease in its value.
Credit proprietorship for any increase in its value.

There are six possible occurrences in every business transaction. (1) These are:

1. Increase of assets.
2. Decrease of assets.
3. Increase of liabilities.
4. Decrease of liabilities.
5. Increase of proprietorship.
6. Decrease of proprietorship.

Since a business transaction is an equal exchange of values the equality of the business equation will never be disturbed, for any changes in the values on one side will be offset by equal changes on the other side. For example:

Ten tons of hay are sold for cash, $150. In this case the assets are increased to the extent of $150 and this is offset by an increase in proprietorship, also of $150. It may

also happen that changes on one side of the equation are offset by equal and opposite changes on the same side. In the illustration given above where the horse was sold for cash, we have an increase in assets offset by an equal decrease in assets, both changes thus taking place on the same side of the equation.

It is obvious that the above mentioned six possible occurrences in every business transaction may take place in a large number of combinations, but we shall find that the total debits in any transaction are always equal to the total credits. (1) The following are some of the combinations which may occur: (2)

<table>
<thead>
<tr>
<th>Increase in assets.</th>
<th>Decrease in assets.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in liabilities.</td>
<td>Increase in liabilities.</td>
</tr>
<tr>
<td>Increase in proprietorship.</td>
<td>Decrease in proprietorship.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Decrease in assets.</th>
<th>Increase in assets.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decrease in liabilities.</td>
<td>Increase in liabilities.</td>
</tr>
<tr>
<td>Decrease in proprietorship.</td>
<td>Increase in proprietorship.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Increase in liabilities.</th>
<th>Decrease in liabilities.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in proprietorship.</td>
<td>Decrease in liabilities.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Decrease in proprietorship.</th>
<th>Increase in assets.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Increase in liabilities.</td>
<td>Increase in liabilities.</td>
</tr>
</tbody>
</table>


(2) Sprague, C.E. The Philosophy of Accounts. Chap. IV.
CLASSES OF ACCOUNTS.

Accounts are commonly divided into two classes, namely, real accounts and nominal accounts.

REAL ACCOUNTS.

It is apparent that one general account with assets would furnish little information of value. It is information in detail concerning the different items among the assets that is essential, and in order to secure this the more important items among the assets are given separate accounts and the items of lesser importance are grouped into classes and an account is kept with each class. Accounts with the liabilities are kept in a similar manner. The function of such accounts is to indicate the value of the assets and the amount of the liabilities, and they are known as real or balance sheet accounts.

NOMINAL ACCOUNTS.

Increases or decreases in the proprietorship will be due to the forces within the business making for loss or for gain. It is essential for purposes of business analysis to keep accounts with these forces, and such accounts are

(1) Hatfield, H.R. Modern Accounting, p.9.
known as nominal or profit and loss accounts. (1)

Nominal accounts may be divided into two classes:
1. Accounts which record expense or outlay.
2. Accounts which record profit or income.

The nominal accounts which it is advisable to keep will vary with each particular business. The outlay and income of the business may be grouped under a few heads or under many. For example: On the farm one account may be kept for feed in which will be recorded all the feed used on the farm, or a separate account may be kept with horse feed, cow feed, poultry feed, etc.. In the same way one account may be kept for all income from farm products, or separate accounts may be kept for income from corn, income from oats, income from hay, etc.. The greater the number of the accounts kept the more detailed will be the information secured, but the more complex will the system become. Care should be exercised that the classification of the expense and of the income be logical and consistent. In a system of financial accounts on the farm it will be found advisable to classify the expense on the basis of its character as is done in the following scheme of accounts. For example: Labor, Feed, Seed, Buildings Expense, and the like, indicate such a classification, whereas such accounts as Teams Expense, Poultry Expense, Dairy Expense,

Cole, W.M. Accounts, Their Construction & Interpretation. p.27.
Rowe, H.M. Bookkeeping and Accountancy. p.79.
may include many items of dissimilar character but relating
to a certain department of the farm. The basis in the latter
case is the department and not the character of the expense.
If the two bases of classification are employed in the same
system of accounts, confusion is sure to result. It is advis­
able to employ the departmental basis only in a system of xx
cost accounts, that is, in a system in which adequate provis­
ion has been made to record such expense and such income ac­
curately and completely.

FISCAL PERIOD.

In every business it is desirable to select a def­
inite time for ascertaining the exact condition of the bus­
iness and the results of its operation. This is sometimes
called the "closing time", for the reason that at this time
all accounts are brought to a close and their contents anal­
yzed. The interval between one closing time and the next is
known as the fiscal period. The fiscal period should always
be uniform in duration, for only then will intelligent compar­
isons of the operation of the business for different periods
be possible.

Usually the fiscal period is a year, and it is made
to coincide with the calendar year. This is not necessary,
however, and there are many instances where it is not the case.
It is well to have the fiscal year end at a time when the extra
work involved in closing the accounts and in taking physical
inventories will cause the least inconvenience. On the farm
this will vary with the locality. (1) In localities where the

winter is rigorous, March 1st will be favored over January 1st as the date for the closing of the fiscal period, since the taking of inventories on the farm is an arduous task in cold weather. The former date is also more likely to correspond to the date of tenancy changes whenever these occur.

THE TRIAL BALANCE. (1)

If each transaction has been correctly analyzed, i.e., the proper accounts debited and credited, it is evident, since the total debits and the total credits involved in every transaction are equal, that the sum of all the debit items in the accounts will be equal to the sum of all the credit items. It also follows that the sum of all the debit balances will be equal to the sum of all the credit balances. A complete statement of the debit and credit balances of the various accounts is known as a Trial Balance.

The function of the trial balance is to test the correctness of the work. It is not a conclusive test, however, as there are certain kinds of errors which it will not disclose. If the trial balance shows a difference between the debits and the credits it may be due to any one of the following errors:

Cole, W.M. Accounts, Their Construction & Interpretation. p.34.  
Hatfield, H.R. Modern Accounting. p.35.  
Rowe, H.M. Bookkeeping and Accountancy. p.131.  
1. Errors in addition.

2. Errors in posting items from the books of original entry to the ledger, such as:
   (a) Posting the wrong amount.
   (b) Posting a debit amount to the credit side of an account, or vice versa.
   (c) Omission of an item.

3. Errors in determination of the debits and credits in the original entry.

The following errors may have taken place even though the trial balance shows the debits and credits to be equal.

1. Errors in posting items to wrong accounts.

2. Errors which exactly balance each other, which may be:
   (a) Errors in addition.
   (b) Errors in posting items from the books of original entry to the ledger.

3. The debits and credits of an entire transaction may not have been posted to the ledger.

It will thus be seen that the trial balance is only a mechanical test, and that it does not point out errors of principle.

THE PROFIT AND LOSS ACCOUNT. (1)

At the end of any fiscal period the balances in the various nominal accounts will indicate the outlays and the

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Cole, W.M. Accounts, Their Construction and Interpretation. p. 29.
Hatfield, H.R. Modern Accounting. p. 37.
Rowe, H.M. Bookkeeping and Accountancy. p. 190.
income that have accrued during that period, the debit bal-
ances representing the outlays and the credit balances the
income. In order to determine the net gain or loss for a
period, and to separate such gain or loss from that of suc-
ceeding periods it is necessary to transfer all the balances
of the nominal accounts into one account which is called the
Profit and Loss account. This process is called closing the
nominal accounts. Whenever there is an element of loss in
connection with an asset, such as depreciation, the amount
of such loss should also be transferred from the respective
real account to the Profit and Loss account. The Profit and
Loss account will then exhibit all the items making for loss
and gain in the business during the period. The losses will
appear on the debit side and the gains on the credit side.
If the debit side is the larger, the balance of the account
will indicate that the result of the operation of the business
has been a net loss; if the credit side is the larger, the
balance of the account will indicate that the result has been
a net gain. This balance, which thus represents the net de-
crease or increase of proprietorship, is then transferred to
the account which indicates the proprietor's interest in the
business.

ADJUSTMENTS IN PROFIT AND LOSS OR NOMINAL ACCOUNTS.

1. Deferred Charges to Profit and Loss.

It is essential for the purpose of accurate business
analysis that the expense properly chargeable to any one
period be set off distinctly from that of preceding or succeed-
ing periods. (1) It sometimes happens that certain items of expense are paid for several years in advance. We may suppose a case in which an insurance premium of $60 has been paid for a term of three years. It is obvious that only one-third of the amount, or $20, is chargeable to any one year. At the end of the first year $20 of the amount would be transferred to the debit side of the Profit and Loss account, and $40 would remain as a balance in the Insurance account. This balance is known as a Deferred Asset or a Deferred Charge to Profit and Loss, and it will appear among the assets in the balance sheet. (2)

2. Accrued Expense Items.

Items of expense which have accrued within a certain period, and which are properly chargeable to it, are sometimes not paid until after the close of the period. All such items should be carefully noted and the proper adjustments made in the accounts when the Profit and Loss account for the period is being made up. To illustrate: Interest payments on Notes Payable are made at irregular periods which but rarely conform to the fiscal year. At the end of the fiscal year the interest which has accrued on such notes should be estimated. This amount should then be entered as a liability inventory on the debit side of the Interest and Discount account, from where it will be transferred as a part of the debit balance of that account to the debit side of the Profit and Loss account. The amount of the accrued interest should then be

(1) Sprague, C.E. The Philosophy of Accounts. p. 61.
(2) Bentley, H.C. The Science of Accounts. p. 56.
Hatfield, H.R. Modern Accounting. p. 118.
brought forward as a credit balance in the Interest and Discount account after this account has been closed, and it should appear among the liabilities in the balance sheet.

3. The Inventory Account.

In similar manner it is essential that all income be credited to the period to which it belongs. On the farm, the sales for any period may include products which have been carried over from the previous period, and therefore some arrangement is necessary whereby a distinction will be made between the sale of products which represent income for the preceding period and those which represent income for the current period. For this reason an account should be kept with the value of the farm products on hand at the beginning of the period. Such an account is called an Inventory account. At the end of the period the balance of this account is transferred to the debit side of the Profit and Loss account, thus serving as a deduction from the income for the period. The products on hand at the close of the period, however, represent income for the current period and their value should be added to the current income. This is done by crediting the Profit and Loss account and debiting the Inventory account, the amount thus appearing as a debit balance in the latter account at the beginning of the next period.

THE BALANCE SHEET.

After all the nominal accounts have been closed into the Profit and Loss account, all items of loss or gain in connection with the real accounts transferred to the same account, and the Profit and Loss account has been closed into the Proprietor's account, it is evident that a trial balance of the ledger will show only assets, liabilities, and proprietorship. A statement showing these facts is called a balance sheet. (1) The balance sheet thus gives a summary view of the condition of the business at the end of a fiscal period.

The arrangement of the various items in the balance sheet is of importance, and may differ in accordance with the purpose for which it is used. It will be advisable always to classify the assets in accordance with the plan suggested in chapter 1, namely, Fixed, Working, and Current. The liabilities should be classified into Fixed and Current, the former class representing the more permanent and the latter class the less permanent obligations of the business to others.

For ordinary purposes it will be best to arrange the assets in the following order: Fixed, Working, and Current, and the liabilities should then be arranged in similar order, i.e., the fixed liabilities preceding the current. This arrangement will make possible an easy comparison of the fixed

(1) See page 23.
assets with the fixed liabilities, likewise a comparison of the working and current assets with the current liabilities. The order of the items gives precedence to the items ordinarily of most importance in a study of the condition of the business.

There are certain conditions, however, under which the chief interest of the person for whom the balance sheet has been prepared will center in a comparison of current assets with current liabilities, the object being to ascertain the ability of the business to meet its current obligations as these come due. This is usually the case when a balance sheet has been submitted with a view to the establishment of credit relations. The banker, for example, although interested in knowing that there are sufficient assets available to secure the principal of a loan, is chiefly interested in knowing that the payments of the interest and the principal of the loan can be made as they become due. In such a case the order of the items in the balance sheet should be reversed, that is, the current assets and the current liabilities should be placed first respectively, and the fixed assets and the fixed liabilities should be placed last.

A balance sheet will be more valuable if it can be compared with the balance sheet of previous years, and for this purpose the comparative balance sheet should be used. The arrangement of this is the same as the arrangement of the comparative Statement of Assets and Liabilities described in chapter 1.
MECHANICAL FEATURES OF DOUBLE ENTRY BOOKKEEPING.


The books and records to be used in a system of financial accounts kept according to double entry will vary with the business. On the farm it will be found advisable to keep a Day Book-Journal, a Cash Book, a Ledger, a Notes Receivable Record, a Notes Payable Record, and an Inventory Record. Of these, the last four are essentially the same as those used in single entry and described in chapter 1. It will be necessary, then, to direct attention only to the day book-journal and the cash book.


This book is ruled the same as the day book-journal used in single entry, but the manner of recording the transactions in it will differ somewhat. In double entry this book is used for making the original entries for all transactions other than cash transactions, the latter being recorded in the cash book. The entry consists of a brief description of the transaction and a statement of the accounts to be debited or credited. These debits and credits must always be equal to each other. In the day book-journal a record should also be made of all adjustments in the accounts, such as the closing of the nominal accounts into the Profit and Loss account. The day book-journal usually appears as follows:
3. The Cash Book.

The cash book is used to record all original entries of cash transactions. Since the cash book used in double entry serves as a book of original entry, it is arranged somewhat differently than the cash book used in single entry which was essentially a book of summary entry. Whenever cash is debited some other account is credited, and whenever cash is credited some other account is debited. On the debit side of the cash book, then, it will be necessary to provide a place for the name of the account to be credited, and on the credit side of the cash book a place for the name of the account to be debited. The illustration below shows how this is usually done:
After all the transactions have been recorded in either the day book-journal or the cash book the debits and credits are transferred to their respective accounts in the ledger.


The accompanying illustration is intended to show the method of transferring the balance of a nominal account to the Profit and Loss account. The amount of the difference between the two sides of the account is entered on the smaller side in red ink. (1) The account is then ruled up as shown.

(1) In general, red ink is used to indicate that the entry is only temporary.
and this balance is entered on the opposite side of the Profit and Loss account in black ink. It will be observed that the balance of the ledger is not disturbed in this process.

<table>
<thead>
<tr>
<th>Month</th>
<th>Labor</th>
<th>Income Corn</th>
<th>Profit and Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov. 31</td>
<td>$18.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dec. 30</td>
<td>$21.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov. 30</td>
<td>$18.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov. 30</td>
<td>$24.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nov. 30</td>
<td>$24.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dec. 31</td>
<td>$140.90</td>
<td></td>
<td>Nov. 17</td>
</tr>
<tr>
<td>Dec. 31</td>
<td>$140.90</td>
<td></td>
<td>Nov. 17</td>
</tr>
<tr>
<td>Dec. 31</td>
<td>$140.90</td>
<td></td>
<td>Nov. 17</td>
</tr>
<tr>
<td>Dec. 31</td>
<td>$140.90</td>
<td></td>
<td>Nov. 17</td>
</tr>
</tbody>
</table>

- **Dec. 15**: $742.80
- **Nov. 17**: $308.00

**Profit and Loss**:
- Nov. 31 Labor 8 $96.00
- Nov. 31 Income Corn 12 $1730.00
- Nov. 31 Rep. Del. 1 $48.00
The transfer of an item of expense or loss from a real or asset account to the Profit and Loss account is effected in a similar manner as the illustration below will show. In this case, however, there will be a balance remaining in the real account.

<table>
<thead>
<tr>
<th></th>
<th>Jan. 1</th>
<th></th>
<th>Dec. 31</th>
<th></th>
<th></th>
<th>Jan. 31</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>400-</td>
<td></td>
<td>48-</td>
<td></td>
<td></td>
<td>43.5k</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>400-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>400-</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Jan. 1 Balance</td>
<td></td>
<td>Jan. 1 Balance</td>
<td></td>
<td></td>
<td>400-</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>43.5k</td>
<td></td>
</tr>
</tbody>
</table>

**Buildings**
Chapter III.

Outline for Double Entry System of Accounts.

The following outline of accounts has been prepared with a view to furnishing a guide for a system of double entry financial accounts for the farm. In general, the purpose of such a system of accounts may be said to be to indicate the financial condition of the business, the facts of importance concerning the value of the assets and the amounts of the liabilities, the chief items of expense incurred in the operation of the farm and the chief sources of income. No attempt has been made in this system to present information relating to the different departments or enterprises of the farm, not to ascertain the cost of producing farm products. These are essential features of departmental or cost accounting and will be considered in that connection. It is evident that adjustments will need to be made in this scheme of accounts to provide for such conditions as may be peculiar to particular farms.
1. Real Accounts, or, Accounts that show Assets & Liabilities.

(1). Land.

Debit this account with

Value of the land exclusive of buildings.

The cost of all permanent improvements that increase the value of the land.

Value of additional land purchased.

Credit this account with

The inventory value of all land sold. (If land is sold for more than its inventory value, the difference should be credited to Profit & Loss; if sold for less, the difference should be debited to Profit & Loss).

The balance of this account will always represent the value of the land in the farmer's possession.

(2). Buildings.

Debit this account with

The value of all farm buildings.

The cost of all new buildings.

The cost of all improvements to buildings.

Credit this account with

The inventory value of any buildings which may be destroyed by fire or otherwise.

At the end of the year with the depreciation of the buildings.

The balance of this account will represent the value of the farm buildings at the end of the year.

# If no insurance was received the Profit & Loss account should be debited at this time. If the loss was entirely covered by insurance, the debit should be to cash instead of to Profit & Loss. If the cash received as insurance is less than the amount at which the building had been carried, the amount received in cash should be debited to Cash and the difference should be debited to Profit & Loss; if the amount received is more than the amount at which the building had been carried in the inventory, the difference should be credited to Profit and Loss.
**3. Implements and Machinery.**

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The value of all machinery and implements on hand.</td>
<td>The inventory value of all machinery and implements sold or disposed of.</td>
</tr>
<tr>
<td>The cost of all machines and implements purchased.</td>
<td>At the end of each year with the depreciation of machines and implements for the year.</td>
</tr>
</tbody>
</table>

The balance of the account will represent the value of the machinery and implements on hand.

*# If more is received than the inventory value, the difference should be credited to Profit & Loss; if less, the difference should be debited to Profit & Loss.*

**4. Teams.**

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The value of all horses and mules on hand used for the work of the farm.</td>
<td>The inventory value of all horses and mules sold or otherwise disposed of.</td>
</tr>
<tr>
<td>The value of all horses and mules acquired for this purpose by purchase or otherwise.</td>
<td>The inventory value of all horses and mules lost by death.</td>
</tr>
</tbody>
</table>

At the end of the year with the depreciation of horses and mules during the year.

The balance of the account will represent the value of the teams on hand.

*# If the amount received is greater than the inventory value the Profit & Loss account should be credited with the difference; if less, the Profit & Loss account should be debited with the difference.*
Plan No. 1.

Debit this account with

The value of all tools on hand.

The cost of all tools purchased or acquired.

Credit this account with

The inventory value of all tools disposed of.

At the end of each year with the depreciation of tools.

The balance of the account will represent the value of the tools on hand.

Plan No. 2.

Debit this account with

The value of the tools on hand.

It may be assumed that the purchase of new tools will just about be equal to the depreciation on the old tools, so that the cost of the new tools may at once be charged to the General Expense Account, and no depreciation need be allowed for in the account. (See below)

(5a).

Tools.

Debit this account with

The value of all harness equipment on hand.

The value of all harness equipment purchased or otherwise acquired.

Credit this account with

The inventory value of all harness equipment disposed of.

At the end of each year with the depreciation of harness equipment.

The balance of this account will represent the value of the harness equipment on hand.

Note: In the case of Plan No. 2 for the Tools account, it may be found advisable to debit the account in the event of any especially large purchase of tools. As far as the ordinary purchases are concerned it will be found in most cases that they are just about equal to the depreciation of the old tools, and one will offset the other.
Debit this account with:

The cost of all miscellaneous supplies on hand, such as lumber, cement, lime, nails, fencing materials, etc.

All purchases of the above class of materials or supplies that are not used at once.

The balance of this account will represent the value of the miscellaneous supplies on hand.

Credit this account with:

The cost of all miscellaneous supplies previously charged to this account which are used in the various farm operations. (At this time debit the account for which they were used.

Farm Live Stock.

Debit this account with:

The value of all cows, hogs, and other live stock kept for farm purposes and not for sale.

The value of all live stock of the above class acquired by purchase or otherwise.

The balance will then represent the value of the live stock used for farm purposes.

Credit this account with:

The inventory value of all farm live stock sold or otherwise disposed of.

At the end of the year with the depreciation of the farm live stock.

# If the amount received is greater than the inventory value, the difference should be credited to Profit & Loss; if less, the difference should be debited to Profit & Loss.
Farm Products Inventory.

Debit this account with

The beginning of the year with the value of the farm products on hand. (After the accounts have once been started this will be the balance carried forward from the preceding year).

At the end of the year with the value of the farm products on hand. At this time the Profit & Loss account should be credited.

Credit this account with

At the end of the year with the amount of the debit made at the beginning of the year. At this time the Profit & Loss account should be debited.

The balance of the account will show the value of the farm products on hand at the beginning of the new year.

The purpose of an inventory account is to locate all income in the period to which it properly belongs. Each year should be given credit for the products produced within it, whether these products are sold within the year or not.

Market Live Stock Inventory.

Debit this account with

The value of all live stock on hand kept for market purposes.

At the end of the year with the value of all market live stock then on hand.

Credit this account with

At the end of the year with the amount of the debit balance at the beginning of the year, representing the value of the market live stock on hand at that time.

The balance of the account will show the value of the market live stock on hand at the beginning of the new year.

After the accounts have been started this amount will be the balance carried forward from the preceding year.
Notes Receivable.

Debit this account with
The face value of all written promises of others to pay us.

Credit this account with
All payments in full or in part on the principal of these written promises.

The balance of the account will represent the amount others owe us on notes or written promises.

Notes Payable.

Debit this account with
All payments, in full or in part, of the principal of these written promises.

Credit this account with
The face value of all written promises by us to pay others.

The balance of this account will represent the amount we owe to others on written promises or notes.

Mortgages Payable.

Debit this account with
All payments on the principal of the mortgage.

Credit this account with
The face value of the mortgage.

The balance of the account will represent the amount of the mortgage remaining unpaid.
### Personal Accounts.

<table>
<thead>
<tr>
<th>Debit these accounts</th>
<th>Credit these accounts</th>
</tr>
</thead>
<tbody>
<tr>
<td>When others get into debt to us.</td>
<td>When we get into debt to others.</td>
</tr>
<tr>
<td>When we get out of debt to others, in whole or in part.</td>
<td>When others get out of debt to us, in whole or in part.</td>
</tr>
</tbody>
</table>

If the debit side of a personal account is the larger, the balance of the account represents the amount that person owes us; if the credit side is the larger, the balance represents the amount we owe that person.

A separate account should be kept with each person or firm with whom we have dealings on credit. No note transactions are included in these accounts, as they are recorded in the Notes Receivable and the Notes Payable accounts.

### Cash.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>All cash received.</td>
<td>All cash paid out.</td>
</tr>
</tbody>
</table>

The balance of the account will represent the cash on hand.

The cash account can be kept to advantage in a separate book, with the debit entries on one side and the credit entries on the other side. See page 16.

### Proprietor.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>All withdrawals of capital from the farm.</td>
<td>The amount of the farmer's net investment at the beginning of the year. (This will be shown by difference between the assets and the liabilities).</td>
</tr>
<tr>
<td>If a net loss has been incurred in operating the farm as shown by the Profit and Loss account, with the amount of such loss.</td>
<td>If a net profit has been earned in operating the farm, as shown by the Profit and Loss account, with the amount of such profit.</td>
</tr>
</tbody>
</table>

The balance of this account will represent the net investment of the farmer.
Nominal Accounts.

(1).

I. Accounts that show expenses or the cost of operation.

Labor.

Debit this account with

All cash payments of wages.

All wages paid in farm products of services.

All board which serves as a part payment of wages. (See note).

The value of the proprietor's

The balance of this account represents the labor cost for the year, and at the end of the year should be transferred to the debit side of the Profit & Loss account. This will be done by crediting the account and debiting the Profit and Loss account.

Note: All board which serves as a part payment of wages should be given a money value. It should then be debited to this account as indicated above and credited to the Household account.

(2).

Seed.

Debit this account with

The value of all farm products, (estimated at the farm value) that are used for seed.

All cash purchases of seed.

The balance of this account will represent the cost of seed. At the end of the year the balance should be transferred to the debit side of the Profit & Loss account. This will be done by crediting this account debiting the Profit and Loss account.

Credit this account with

Any deductions to be made from the cost of labor; e.g. when there is an income from labor rented to a neighbor or used for some purpose not connected with the operation of the farm.

See statement below concerning the balance.
### (3). Feed.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The value of all farm crops, estimated at the farm value, used for feeding purposes.</td>
<td>See statement below concerning the balance.</td>
</tr>
<tr>
<td>All cash purchases of feed.</td>
<td></td>
</tr>
</tbody>
</table>

The balance of this account will represent the cost of feed. At the end of the year it should be transferred to the debit side of the Profit and Loss account. This will be done by crediting this account and debiting the Profit and Loss account.

### (4). Building Repairs.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cost of all repairs on buildings.</td>
<td>See statement below concerning the balance.</td>
</tr>
</tbody>
</table>

The balance of this account will represent the cost of building repairs, and at the end of the year should be transferred to the debit side of the Profit & Loss account. This will be done by crediting this account and debiting the Profit & Loss account.

### (5). Machinery Repairs.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cost of all repairs on machinery and implements.</td>
<td>See statement below concerning the balance.</td>
</tr>
</tbody>
</table>

The balance of this account will represent the cost of machinery repairs, and at the end of the year should be transferred to the debit side of the Profit & Loss account. This will be done by crediting this account and debiting the Profit & Loss account.
### Interest & Discount

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>All payments of interest to others.</td>
<td>All payments of interest by others to us.</td>
</tr>
</tbody>
</table>

If the debit side of the account is the larger, the balance will represent a loss and should be transferred to the debit side of the Profit & Loss account. If the credit side is the larger, the balance will represent a gain and should be transferred to the credit side of the Profit & Loss account. See page for treatment of accrued interest.

### Insurance & Taxes

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>All payments of insurance premiums on farm property.</td>
<td>See statement below concerning the balance.</td>
</tr>
<tr>
<td>All payments of taxes on farm property.</td>
<td></td>
</tr>
</tbody>
</table>

The balance of this account will represent the cost of insurance and taxes, and at the end of the year should be transferred to the debit side of the Profit & Loss account by crediting this account and debiting the Profit and Loss account. See page for treatment of insurance.

### Fertilizer

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>All cash purchases of fertilizer.</td>
<td>At the end of the year with the value of any fertilizer on hand not applied to the soil.</td>
</tr>
</tbody>
</table>

The balance of this account will represent the cost of fertilizer for the year and should be transferred to the debit side of the Profit & Loss account. This will be done by crediting this account and debiting the Profit and Loss account.

*After the account has been closed and the balance transferred to the Profit and Loss account, the amount on hand at the end of the year should be carried forward to the debit side of the account for the new year, as it represents the value of the fertilizer on hand at the beginning of the new year.*
Household.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>All expenses that are not farm expenses but more properly personal expenses of the farmer.</td>
<td>The value of the proprietor's labor which is spent in the operation of the farm.</td>
</tr>
<tr>
<td>The value of all farm produce used in the household.</td>
<td>The value of all board and lodging of laborers. (See Labor account).</td>
</tr>
<tr>
<td>An amount representing the rental of the farm dwelling.</td>
<td>All income that is not farm income, e.g. sales of garden produce, poultry, etc.</td>
</tr>
</tbody>
</table>

The balance of this account will represent either a net withdrawal or a net additional investment by the farmer. If the debit side is the larger, the balance will represent a net withdrawal and should be transferred to the debit side of the Proprietor's account; if the credit side is the larger the balance will represent a net additional investment and should be transferred to the credit side of the Proprietor account.

General Expense.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>All expenses of the farm not properly chargeable to any of the special expense accounts.</td>
<td>See statement below concerning the balance.</td>
</tr>
</tbody>
</table>

The balance of this account will represent the miscellaneous expense for the year and should be transferred to the debit side of the Profit and Loss account. This will be done by crediting this account and debiting the Profit & Loss account.
### (11).
**Market Live Stock Purchases.**

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>All purchases of market live stock.</td>
<td>Statement below concerning the balance.</td>
</tr>
</tbody>
</table>

The balance of this account will represent the purchases of market live stock and at the end of the year should be transferred to the debit side of the Profit and Loss account.
## Nominal Accounts

### II. Accounts that show income

### (1). Income Corn

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>See statement below concerning the balance.</td>
<td>All sales of corn.</td>
</tr>
<tr>
<td></td>
<td>The market value of all corn used on the farm as feed or as seed.</td>
</tr>
</tbody>
</table>

The balance of this account will represent the income from corn and at the end of the year should be transferred to the credit side of the Profit & Loss account. This will be done by debiting this account and crediting the Profit & Loss account.

### (2). Income Wheat

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>See statement below concerning the balance.</td>
<td>All sales of wheat.</td>
</tr>
<tr>
<td></td>
<td>The market value of all wheat used for the farm as seed or as feed for other purposes.</td>
</tr>
</tbody>
</table>

The balance of this account will represent the income from wheat and at the end of the year should be transferred to the credit side of the Profit & Loss account. This will be done by debiting this account and crediting the Profit & Loss account.

### (3). Income Oats

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>See statement below concerning the balance.</td>
<td>All sales of oats.</td>
</tr>
<tr>
<td></td>
<td>The market value of all oats used on the farm as seed or as feed.</td>
</tr>
</tbody>
</table>

The balance of this account will represent the income from oats and at the end of the year should be transferred to the credit side of the Profit & Loss account. This will be done by debiting this account and crediting the Profit & Loss account.
(4). Income Hay.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>See statement below concerning the balance.</td>
<td>All sales of hay.</td>
</tr>
</tbody>
</table>

The market value of all hay used on the farm for feed or other purposes.

The balance of this account will represent the income from hay and at the end of the year should be transferred to the credit side of the Profit & Loss account. This will be done by debiting this account and crediting the Profit and Loss account.

(5). Income Market Live Stock.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>See statement below concerning the balance.</td>
<td>All sales of market live stock.</td>
</tr>
</tbody>
</table>

The market value of all market live stock used for household purposes. (at this time debit the Household Expense Account).

The balance of this account will represent the income from market live stock and at the end of the year should be transferred to the credit side of the Profit & Loss account. This will be done by debiting this account and crediting the Profit & Loss account.

(6). Income Dairy.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>See statement below concerning the balance.</td>
<td>All sales of dairy produce.</td>
</tr>
</tbody>
</table>

The market value of all dairy produce used in the household. (At this time debit the Household account).

The balance of this account will represent the income from the dairy and should be transferred at the end of the year to the credit side of the Profit & Loss account. This will be done by debiting this account and crediting the Profit and Loss account.
Miscellaneous Income.

Debit this account with
See statement below concerning the balance.

Credit this account with
All income other than that to be recorded in the accounts described above.

The balance of this account will represent the miscellaneous income, and at the end of the year should be transferred to the credit side of the Profit and Loss account. This will be done by debiting this account and crediting the Profit and Loss account.

Profit & Loss Account.

Debit this account with
The balances of the Farm Products Inventory and the Market Live Stock Inventory accounts. (These amounts represent the value of the farm products and of the market live stock on hand at the beginning of the current year, i.e. those carried over from the preceding year).

The balance of the Market Live Stock Purchases account.

The debit balances from the following accounts: Labor, Seed, Food, Building Repairs, Machinery Repairs, Insurance & Taxes, General Expense, Fertilizer, Interest & Discount.

Credit this account with
The value of the farm products on hand at the end of the year.

The value of the market live stock on hand at the end of the year.


All profits accruing from the sale of assets, e.g. when assets are sold for an amount greater than the amount at which they had been carried in the inventory.

All losses on assets incurred during the year, such as,
(a) Losses due to sale of assets for less than inventory value.
(b) Losses due to the destruction of assets by fire, etc., not covered by insurance.
(c) Losses due to the depreciation of assets.

If the credit side of this account is the larger, the balance will represent the net gain of the farm for the year and it should be transferred to the credit side of the Proprietor's account. If the debit side of the account is the larger, the balance will represent the net loss of the farm and it should be transferred to the debit side of the Proprietor's account.
A scientific farm management is a management which takes into account all the facts of significance in the operation of the farm. The purposes of farm cost accounting should be to furnish the proprietor or manager of the farm with accurate and comprehensive data so that he may be able to approach the problems of farm management in a scientific manner.

In order that the purpose of farm cost accounting may be carried out effectively it is necessary that the accountant have a definite conception of the nature and character of farm management problems. (1) In this connection it will be proper only to point out in a general way what the problems are, not to enter into a detailed discussion of the same. (2)


(2) For extended discussions of farm management the reader is referred to the following:
Card, F. W. Farm Management.
Krafft, Dr. Guido-Die Betriebslehre. 7te Auflage.
Warren, C. F. Farm Management.
Carver, T. M. Principles of Rural Economics. Chap. 3 & 4.
Farm management problems may be considered to center around the following points: (1)

1. The factors of production. (Betriebserfordernisse.)
2. The system of farming. (Betriebseinrichtung.)
3. The organization and operation of the farm. (Betriebsleitung.)
4. Marketing. (Marktsverhältnisse.)

The first set of these problems may be considered as the problems of investment. (2) The factors of production on the farm consist of the land, the farm equipment, and labor, (3) and each of these factors in turn has its own distinct problems. In the case of land, farm management must take into account the location, the topography, the soil, and the climate. (4)


(3) This classification corresponds only roughly to the factors of production commonly recognized by economists. The classification (land, labor, capital) employed by the latter is not satisfactory from the standpoint of farm management as it presents itself to the individual farmer. A large part of his investment, or capital, is in the form of land, and this would lead to confusion if the classification employed in economic theory were adopted.

The location of the land has a definite bearing upon the problems of transportation and marketing. It is also of importance from a social standpoint. The topography of the land, the character of the soil, and the climate, each have an influence in determining the system of farming to be employed, and must be given consideration in the operation of the farm. The character and type of buildings, the kinds of machinery and implements, the number of horses, the character of the other live stock necessary for production purposes are suggestive of the problems of farm equipment. The conditions controlling the supply of capital, and the availability and character of the labor supply are matters which must receive due attention in any well-planned system of farm management. In addition to these more or less independent problems, the law of proportionality must be worked out, namely, the proportion of the entire investment of the farm that shall be in the form of land, of farm equipment, and of labor. (1)

Two distinct types or systems of farming may be followed. These may be designated as general farming and as special farming. (2) In general farming emphasis is placed either on the production of grains or on the production of

(2) Card, F. W. Farm Management. p. 73.
live stock, although not infrequently these are combined and there results what is termed a mixed system of farming. In special farming attention is centered almost exclusively upon particular enterprises, such as Horticulture, Gardening, Dairying, Poultry, and the like. The system of farming to be employed will depend in large measure upon the conditions surrounding the factors of production, however, the individuality of the farmer is also an important factor. The most profitable system of farming to be employed will not necessarily be the same for different farmers at the same time and place, also will not necessarily be the same for the same farmer at different times or in different places. (1)

The organization and operation of the farm consists in such things as the proper correlation of the factors of production, the economical arrangement of fields, the utilization of labor and equipment in the most efficient manner and combinations, the correct adjustment of field crops to each other and to live stock, the devising of suitable systems of cropping, and the practice of efficient methods of crop production. The manager should aim to secure the largest product and the greatest profit per acre and per worker, and to do this while increasing, or at least maintaining, the productivity of the soil. (2) Farm manage-

ment policy may be termed successful only when it leads to a permanently prosperous agriculture. "Mining the soil" has no place in a scheme of scientific farm management. It is unfortunate that in the past the factor of depreciation has been overlooked in farming in so far as it has taken the form of the declining fertility of the soil. Rising prices of farm products may be due to social causes, to improved transportation, to rising prices of farm products, and to increases in crop yields due to better seed selection and to improvements in the mechanical phases of cultivation. We have been blind to the fact that rising land values and increased productivity may thus take place simultaneously with a declining fertility of the soil.

Marketing involves both the problems of buying and of selling. As the farm becomes more commercial in its character, the problems of marketing become more numerous and more important. Specialization in agriculture and in agricultural products leads to the same result. (1) The time and method of purchasing the farm supplies and of selling the farm products, the relative merits of cooperative buying and selling and of individual buying and selling, the extent to which advertising shall be employed, the advantageous utilization of credit, and the like, are problems of importance to the farm manager, and concerning which it is essential that his accounts furnish him definite facts.

THE AIM OF COST ACCOUNTING.

1. The Aim Varies with the Industry.

The aim of cost accounting in all industrial enterprises is not the same. In establishments producing a commodity the price of which is under the control of the producer, the cost per unit of product is of importance in fixing the price. This is especially true in engineering enterprises where much work is done on contracts rather than in producing stock goods for an open market. The producer is interested primarily in knowing at what price he can afford to sell.

In establishments producing a commodity for the open market in which the price is already fixed by competition, the aim of the cost accounting system should be to indicate what commodities are the most profitable to produce. The price of commodities may often be fixed by more favorably situated competitors, or by competitors who are losing but are not aware of the fact. In such establishments a very important phase of the cost accounting work is what is frequently termed "testing out". The farm is essentially an enterprise of this second class. As an individual the farmer cannot hope to control the price of farm products. Rather he must seek to hate his cost

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(2) Hatfield, H.R. Modern Accounting. p.294.
Laur, E. Grundlagen und Methoden der Bewertung, Buchhaltung, und Kalkulation in der Landwirtschaft. p.112.
accounting system point out to him the most profitable adjustment of his farm to the prevailing business and economic conditions.

2. Cost Accounting a Scientific Method of Comparison.

Since the farmer cannot control the price of his products he should use his cost accounting system to test out the various policies of farm management which may be open to him. This applies both to the general type or system of farming and to the individual enterprises or departments of the farm.

The cost accounts should supply the farmer with accurate information concerning the comparative profitability of general farming and of special farming at any particular time. He should know which particular type of general farming, namely livestock, grain, or mixed farming, or which particular type of special farming will yield him the largest net returns. The accounts should also keep him informed as to the increasing or decreasing profitability of the different systems of farming as business and economic conditions change.

Very similar will be the determination of the comparative profitableness of intensive and of extensive farming. The accounts should show the operation of the law of diminishing returns, so that it will be possible to know what proportions of land, equipment, and labor will yield the largest net return.
It often happens that whereas the farm as a whole is realizing a profit, certain enterprises of the farm are being operated at a loss. It may be that these enterprises can be eliminated from the farm, or the conditions of their operation so changed that they will realize a profit, thus increasing the profit of the farm as a whole. It is important, then, that the cost accounts should reveal in detail the conditions obtaining in each department or enterprise of the farm.

In testing out enterprises, however, they should be studied from two standpoints, as follows:

1. As independent enterprises. The exact profitableness of each enterprise, as such, should be carefully ascertained. This will make it possible to give emphasis in the farm organization to those enterprises which are likely to realize the largest profit.

2. As related enterprises. An enterprise considered separately may be profitable, but it may not fit in well with the other enterprises that are an essential part of the system of farming that is being followed. Another enterprise, although not so profitable when considered separately, may make possible a more efficient utilization of land, labor, and equipment when combined with other enterprises, and thus result in a larger profit from the operation of the farm as a whole. (1)


Cost accounting should provide the farmer not only with information as to what it costs but also why it costs what it does. There should be a detailed analysis of costs. In this way inefficiencies and wastes in operation will be pointed out and their elimination made possible. (1) The farmer's accounts should give him definite information upon which to base decisions regarding the respective advantages of different methods of farm operation, such as for example, the substitution of motor power for horse power, or the substitution of machine labor for hand labor. The attention of the successful farmer must constantly be directed toward such problems as the reduction of man labor, horse labor, and machinery costs, and an analysis of costs by operations is necessary in order to do this.

Chapter V.

Outline for Cost Accounting System.

The following outline has been prepared as a guide for a system of cost accounts. As indicated in Chap. 4 such a system should be used for securing the information essential to a scientific farm management. Provision has been made for ascertaining the exact cost of producing farm crops, and in the case of enterprises such as feeding cattle, dairy, hogs, and the like, for recording accurately all the expense and all the income attributable to that enterprise. In this way it will be possible to know the exact conditions obtaining in each department of the farm. The outline is necessarily general in character and will need to be adjusted to the conditions prevailing on particular forms.
### REAL ACCOUNTS.

#### (1).

**Land.**

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The value of the land exclusive of buildings.</td>
<td>The inventory value of all land sold.</td>
</tr>
<tr>
<td>The cost of all permanent improvements that increase the value of the land.</td>
<td></td>
</tr>
<tr>
<td>The value of additional land purchased.</td>
<td></td>
</tr>
</tbody>
</table>

The balance of this account will represent the value of the land in the farmer's possession.

# If the land is sold for more than its inventory value, the difference should be credited to Profit & Loss; if sold for less, the difference should be debited to Profit & Loss.

#### (2).

**Buildings.**

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The value of all the buildings on the farm.</td>
<td>The inventory value of any buildings which may be destroyed by fire or otherwise.</td>
</tr>
<tr>
<td>The cost of all new buildings.</td>
<td>At the end of each year with the depreciation of the buildings.</td>
</tr>
<tr>
<td>The cost of all improvements to buildings.</td>
<td></td>
</tr>
</tbody>
</table>

The balance of this account will represent the value of the farm buildings.

# If no insurance was received the Profit and Loss account should be debited at this time. If the loss was entirely covered by insurance, the debit should be to cash instead of to Profit and Loss. If the cash received as insurance is less than the amount at which the building had been valued in the inventory, the amount received in cash should be debited to Cash and the difference should be debited to Profit and Loss; if the amount received is more than the amount at which the building had been valued in the inventory the difference should be credited to Profit and Loss.
(3). Corn Machinery.

Debit this account with
The value of all machinery used exclusively in the production of corn.
The cost of all additions to this class of machinery.

Credit this account with
The inventory value of all corn machinery that may be disposed of by sale or otherwise.#
At the end of each year with the depreciation of the corn machinery. (At this time debit the Corn machinery Expense acct).

The balance of this account will represent the value of the corn machinery.

# If more is received for the machinery than this inventory value, the difference should be credited to Profit and Loss; if less, the difference should be debited to Profit and Loss.

(4). Hay Machinery.

Debit this account with
The value of all machinery used exclusively in the production of hay.
The cost of all additions to this class of machinery.

Credit this account with
The inventory value of all hay machinery that may be disposed of by sale or otherwise.#
At the end of each year with the depreciation of the hay machinery. (At this time debit the hay machinery Expense Acc't).

The balance of this account will represent the value of the hay machinery.

# If more is received for the machinery than the inventory value, the difference should be credited to Profit and Loss; if less, the difference should be debited to Profit and Loss.
Debit this account with
The value of the machinery used exclusively in the production of the various grain crops. (This does not include the machinery classified as corn machinery.)
The cost of all additions to this class of machinery.

Credit this account with
The inventory value of all grain machinery that may have been disposed of by sale or otherwise.
At the end of each year with the depreciation of the grain machinery. (At this time debit the Grain Machinery Expense account).

The balance of this account will represent the value of the grain machinery.

If more is received for the machinery than the inventory value, the difference should be credited to Profit and Loss; if less, the difference should be debited to Profit and Loss.

Debit this account with
The value of all machinery used exclusively in the dairy.
The cost of all additions to this class of machinery.

Credit this account with
The inventory value of all dairy machinery that may have been disposed of by sale or otherwise.
At the end of each year with the depreciation of the dairy machinery. (At this time debit the Dairy Machinery Expense account).

The balance of this account will represent the value of the dairy machinery.

If more is received for the machinery than the inventory value, the difference should be credited to Profit and Loss; if less, the difference should be debited to Profit and Loss.
Debit this account with

The value of the machinery used in the production of all crops.

The cost of all additions to this class of machinery.

Credit this account with

The inventory value of all machinery of this class that may have been disposed of by sale or otherwise. #

At the end of each year with the depreciation of the machinery in this class. (At this time debit the All Crop Machinery Expense account.)

The balance of this account will represent the value of the machinery used in the production of all the crops.

# If more is received for the machinery than the inventory value, the difference should be credited to the Profit and Loss account; if less, the difference should be debited to the Profit and Loss account.

Miscellaneous Machinery & Major Equipment.

Debit this account with

The value of any machinery not included in the foregoing classes, as, for example, power machinery.

The cost of all machinery of this class added to the equipment of the farm.

Credit this account with

The inventory value of all machinery of this class that may have been disposed of by sale or otherwise.#

At the end of each year with the depreciation of this class of machinery. (See below).

The balance of this account will represent the value of the machinery not included in any of the foregoing classes.

# If more is received for the machinery than this, the difference should be credited to Profit and Loss; if less, the difference should be debited to Profit and Loss.

Note: In the case of the more valuable machines of this sort, it will be found advisable to keep a separate account for each machine.

The Miscellaneous Machinery Expense account should be debited with the amount of the depreciation.
(9).

**Teams.**

Debit this account with

The value of all horses and mules on hand used for the work of the farm.

The value of all horses and mules acquired for this purpose by purchase or otherwise.

Credit this account with

The inventory value of all horses and mules sold or otherwise disposed of.

The inventory value of all horses and mules lost by death.

At the end of the year with the depreciation of horses and mules. (See below).

The balance of this account will represent the value of the teams.

# If more is received than the inventory value, the difference should be credited to Profit and Loss; if less, the difference should be debited to Profit and Loss.

## The Profit and Loss account should be debited for all losses by death.

Note: The Teams Expense account should be debited for the amount of the depreciation of teams.

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(10).

**Tools and Miscellaneous Minor Equipment.**

**Plan No. 1.**

Debit this account with

The value of all tools on hand.

The value of all tools purchased or acquired.

Credit this account with

The inventory value of all tools disposed of by sale or otherwise.

At the end of each year with the depreciation of tools. (At this time debit General Expense acc't).

The balance of this account will represent the value of the tools on hand.

# If more is received for the tools than the inventory value, the difference should be credited to Profit and Loss; if less, the difference should be debited to Profit and Loss.
### Harness Equipment and Stable Supplies.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The value of all harness equipment on hand.</td>
<td>The inventory value of all harness equipment disposed of by sale or otherwise.</td>
</tr>
<tr>
<td>The value of all harness equipment purchased or otherwise acquired.</td>
<td>At the end of the year with the depreciation of harness equipment. (At this time debit the Teams Expense account).</td>
</tr>
</tbody>
</table>

The balance of this account will represent the value of the harness equipment.

*# If more is received for the harness than the inventory value, the difference should be credited to Profit and Loss; if less, the difference should be debited to Profit and Loss.*

### Orchard.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The original cost of trees and planting.</td>
<td>(See below).</td>
</tr>
<tr>
<td>The cost of the care of the trees until the orchard reaches maturity. (This will include principally day and rate labor and will be secured from the labor record).</td>
<td></td>
</tr>
</tbody>
</table>

The balance of this account will represent the investment in the orchard.

### General Supplies.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cost of all miscellaneous supplies on hand, such as lumber, cement, lime, nails, fencing material, etc.</td>
<td>The cost of all miscellaneous supplies previously charged to this account, which are used in the various farm operations. (At this time debit the account for which they were used).</td>
</tr>
<tr>
<td>All purchases of the above class of materials or supplies that are not used at once.</td>
<td></td>
</tr>
</tbody>
</table>

The balance of this account will represent the value of the miscellaneous supplies on hand.
**Dairy Cattle.**

Debit this account with

The value of all cattle on hand kept for the dairy and not for sale.

The cost of all cattle purchased for the dairy.

Credit this account with

The inventory value of all dairy cattle lost by death. (At this time debit the Profit and Loss account).

The balance of this account will represent the value of the dairy cattle.

If sold and the amount received for the cattle is greater than the amount at which they had been valued in the inventory, the difference should be credited to Profit and Loss; if less, the difference should be debited to Profit and Loss.

**Notes Receivable.**

Debit this account with

The face value of all notes or written promises of others to pay us.

Credit this account with

All payments, in full or in part, on the principal of these notes or written promises.

The balance of this account will represent the amount others owe us on notes or written promises.

**Notes Payable.**

Debit this account with

All payments, in full or in part, on the principal of these written promises or notes.

Credit this account with

The face value of all notes or written promises by us to pay others.

The balance of this account will represent the amount we owe to others on notes or written promises.
Debit this account with All payments on the principal of the mortgage.

Credit this account with The face value of the mortgage.

The balance of this account will represent the amount remaining unpaid on the mortgage.

Debit these accounts

When people get into debt to us.
When we get out of their debt, in whole or in part.

Credit these accounts

When we get into debt to others.
When others get out of our debt, in whole or in part.

If the debit side of a personal account is the larger the balance of the account represents the amount that person owes us; if the credit side is the larger the balance represents the amount we owe that person.

A separate account should be kept with each person or firm with whom we have dealings on credit. No note transactions are included in these accounts, as they are provided for in the Notes Receivable and Notes Payable accounts.

Debit this account with All cash received.

Credit this account with All cash paid out.

The balance of this account will represent the cash on hand.

The cash account can be kept to advantage in a separate book, with the debit entries on one side and the credit entries on the other side.
### (20). Proprietor.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>All withdrawals of capital from the farm.</td>
<td>The amount of the farmer's net investment at the beginning of the year. (This will be the difference between the assets and the Liabilities).</td>
</tr>
<tr>
<td>If a net loss has been incurred in operating the farm as shown by the Profit and Loss account, with the amount of such loss.</td>
<td>If a net profit has been earned in operating the farm as shown by the Profit and Loss account, with the amount of such profit.</td>
</tr>
<tr>
<td>All additional investments of the farmer in the farm.</td>
<td>All additional investments of the farmer in the farm.</td>
</tr>
</tbody>
</table>

The balance of this account will represent the net investment of the farmer.
Debit this account with

All cash payments for extra labor.

All payments in the form of farm products or services on account of extra labor. (At this time credit the account representing these products or services).

All payments in the form of board and lodging on account of extra labor. (At this time credit the Household account).

Credit this account with

Any income which may be derived from renting out extra labor for which we are paying.

At the end of each month with the balance of this account. (At this time debit the various operating accounts according to the amount of extra labor spent on each as determined by the labor record).

The balance of this account which is transferred to the operating accounts as indicated above, represents the cost of day labor.

Regular Labor.

Debit this account with

All cash payments of regular labor.

All payments in the form of farm products or services on account of regular labor. (At this time credit the account representing these products or services).

All payments in the form of board and lodging on account of regular labor. (At this time credit the Household account).

All rental for houses occupied by regular laborers. (At this time credit the Profit and Loss account).

Credit this account with

Any income which may be derived from renting out regular labor for which we are paying.

At the end of each month with the balance of this account. (At this time debit the various operating accounts according to the amount of regular labor spent on each as determined by the labor record).

The value of all labor of the proprietor or of members of his family who do not receive cash or other wages. (At this time credit the Household account).

The balance of this account, which is transferred to the operating accounts as indicated above, represents the cost of labor.
Debit this account with

All direct team expense, such as cash purchases of feed, farm products used for feed, veterinary fees, medicine, shoeing, harness repairs, etc.

All labor spent in feeding and taking care of teams. This will be determined from the labor records. (At this time, i.e. at the end of each month, the labor account will be credited).

The depreciation indicated in the following accounts: Harness Equipment, Teams.

A proper portion of the balance of the Buildings Expense account. (This will be determined according to the benefit the teams derive from the buildings as explained more fully in another connection.) (At this time the Buildings Expense Account will be credited).

The interest on the investment in Teams. (At this time credit the Interest on Investment account).

Credit this account with

Any income derived from renting out teams.

At the end of the year with the balance of this account. (The balance should be distributed among the various operating accounts according to the amount of team labor spent on each as determined from the Team Record).

The value of the manure produced by the teams. (At this time debit the Fertilizer account).

The value of all colts raised on the farm.

The balance of this account, which will be transferred to the various operating accounts as indicated above, represents the cost of horse or team labor.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cost of all repairs to buildings.</td>
<td>At the end of the year with the balance of this account. This should be distributed among the various operating accounts in accordance with the uses to which the buildings have been put.</td>
</tr>
<tr>
<td>At the end of the year with the depreciation on buildings as shown by the Buildings account.</td>
<td></td>
</tr>
<tr>
<td>At the end of the year with the interest on the investment in buildings. (At this time credit the interest on Investment account).</td>
<td></td>
</tr>
</tbody>
</table>

The balance of this account, which will be transferred to the debit side of the various operating accounts as indicated above, will represent the cost of maintenance of the buildings.

## (5). Corn Machinery Expense.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cost of all repairs and supplies to corn machinery.</td>
<td>At the end of the year with the balance of this account. (At this time debit the Corn Field Operating account).</td>
</tr>
<tr>
<td>At the end of the year with the depreciation of corn machinery as shown by the Corn Machinery account.</td>
<td></td>
</tr>
<tr>
<td>At the end of the year with the interest on the investment in corn machinery. (At this time credit the Interest on investment account).</td>
<td></td>
</tr>
</tbody>
</table>

The balance of this account, which will be transferred to the debit side of the Corn Field Operating account as indicated above, represents the cost of maintenance of the corn machinery.
<table>
<thead>
<tr>
<th>Hay Machinery Expense.</th>
<th>Grain Machinery Expense.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Debit this account with</strong></td>
<td><strong>Debit this account with</strong></td>
</tr>
<tr>
<td>The cost of all repairs and supplies to hay machinery.</td>
<td>The cost of all repairs and supplies to grain machinery.</td>
</tr>
<tr>
<td>At the end of the year with the depreciation of the hay machinery as shown by the Hay Machinery account.</td>
<td>At the end of the year with the depreciation of the grain machinery as shown by the Grain Machinery account.</td>
</tr>
<tr>
<td>At the end of the year with the interest on the investment in hay machinery. (At this time credit the Interest on Investment account).</td>
<td>At the end of the year with the interest on the investment in grain machinery. (At this time credit the Interest on Investment account).</td>
</tr>
</tbody>
</table>

The balance of this account, which will be transferred to the debit side of the Hay Field Operating account as indicated above, will represent the cost of maintenance of the hay machinery.

<table>
<thead>
<tr>
<th><strong>Debit this account with</strong></th>
<th><strong>Credit this account with</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>At the end of the year with the balance of this account. (At this time debit the Hay Field Operating account).</td>
<td>At the end of the year with the balance of this account. (At this time debit the Grain Field Operating account).</td>
</tr>
</tbody>
</table>

The balance of this account, which will be transferred to the various grain field operating accounts as indicated above, will represent the cost of maintenance of grain machinery.
(8). Dairy Machinery Expense.

Debit this account with
The cost of all repairs and supplies to dairy machinery.
At the end of the year with the depreciation of the dairy machinery as shown by the Dairy Machinery Account.
At the end of the year with the interest on the investment in dairy machinery. (At this time credit the Interest on Investment account).

Credit this account with
At the end of the year with the balance of this account. (At this time debit the Dairy Operating account).

The balance of this account, which will be transferred to the debit side of the Dairy Operating account as indicated above, will represent the cost of maintenance of the dairy machinery.

(9). All Crop Machinery Expense.

Debit this account with
The cost of all repairs and supplies to the all crop machinery.
At the end of the year with the depreciation of the all crop machinery as shown by the all crop machinery account.
At the end of the year with the interest on the investment in all crop machinery. (At this time credit the Interest on Investment account).

Credit this account with
At the end of the year with the balance of this account.
At this time the various operating accounts should be debited in accordance with the amount of time the all crop machinery was used on each. (This will be determined from the machine record).

The balance of this account, which will be transferred to the debit side of the various operating accounts as indicated above, will represent the cost of maintenance of the all crop machinery.
### Miscellaneous Machinery Expense.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cost of all repairs and supplies to miscellaneous machinery.</td>
<td>At the end of the year with the balance of this account. (At this time debit the various operating accounts in accordance with the use to which the miscellaneous machinery has been put). (This will be determined by means of the machine record).</td>
</tr>
<tr>
<td>At the end of the year with the depreciation of the miscellaneous machinery as shown by the Miscellaneous Machinery account.</td>
<td></td>
</tr>
<tr>
<td>At the end of the year with the interest on the investment in miscellaneous machinery. (At this time credit the Interest on Investment account).</td>
<td></td>
</tr>
</tbody>
</table>

The balance of this account, which will be transferred to the debit side of the various operating accounts as indicated above, will represent the cost of maintenance of the miscellaneous machinery.

# As explained in connection with the Miscellaneous Machinery account, miscellaneous machinery refers to all farm machinery not properly to be included in any of the other classes. In the case of the more valuable machines, such as traction engines, etc., it is advisable to keep a separate account for each machine and in that event a separate expense account should also be kept for each machine.

### Insurance.

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>All cost of insurance of farm property.</td>
<td></td>
</tr>
</tbody>
</table>

The balance of this account, which will be transferred to the debit side of the various operating accounts as indicated above, will represent the cost of insurance and taxes for the year.

Note: See page for manner of handling prepaid or accrued insurance.
(12).
**Taxes.**

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>All payments of taxes on farm property.</td>
<td>The balance of this account, which will be transferred to the debit side of the various operating accounts as indicated above, will represent the cost of taxes for the year.</td>
</tr>
</tbody>
</table>

**Note:** See page for manner of handling prepaid of accrued taxes.

(13).
**Fertilizer.**

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The cost of all fertilizer purchased.</td>
<td>All interest received on Notes Receivable.</td>
</tr>
<tr>
<td>The value of all barn manure produced on the farm. (At this time credit the various live stock accounts).</td>
<td></td>
</tr>
</tbody>
</table>

If there is a balance in this account, it will represent the value of the fertilizer on hand which has not yet been applied to the soil.

(14).
**Interest and Discount.**

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>All payments of interest on mortgages or notes payable by us to others.</td>
<td>All interest received on Notes receivable.</td>
</tr>
</tbody>
</table>

If the debit side of this account is the larger it will represent a loss and should be transferred to the debit side of the profit and Loss account; if the credit side of this account is the larger it will represent a gain and should be transferred to the credit side of the Profit and Loss account.

**Note:** See page for manner of handling prepaid or accrued interest.
Debit this account with  
All expense not properly chargeable to any of the special expense or operating accounts.

Credit this account with  
At the end of the year with the balance of this account. (At this time debit the various operating accounts). Note: The basis on which this should be distributed will be explained elsewhere.

The balance of this account, which will be transferred to the debit side of the various operating accounts as indicated above, will represent the expense not properly chargeable to the special expense or operating accounts.
Debit these accounts with

The value of all corn (wheat, oats, timothy) on hand at
the end of the season as shown
by the Corn (wheat, oats, timothy)
Operating accounts.

Credit these accounts with

The value of all corn (wheat, oats, timothy) previously
charged to this account that
is used on the farm.

After all the corn (wheat, oats, timothy) has been sold the balance of this account
will represent the difference between the
estimate of what the corn (wheat, oats, timothy) would realize and the amount act­
ually received for it. If the debit side
of the account is the larger the balance
will represent that the estimate of what
it would realize (indicated by the credit
entry in the operating account) was too
high and the balance should accordingly be
transferred to the debit side of the Profit
and Loss account; if the credit side is the
larger the balance will indicate that more
was realized than was expected and the bal­
ance should be transferred to the credit side
of the Profit and Loss account.

If the value of the corn (wheat, oats, timothy) on hand at the end of the year be
estimated at the price they would bring on the
market at that time, the balance of this account
will represent the loss or gain which is due to
keeping the corn (wheat, oats, timothy) instead
of selling it sooner.

# A separate account should be kept for each crop.
### Household

#### Debit this account with

- All personal or household expenses of the farmer.
- The value of all farm products used in the household. (At this time credit the various operating accounts).
- All withdrawals of cash for personal or household use by the farmer.
- All farm labor and farm costs incurred for the household, such as man and team labor, etc., spent on the garden. (The garden may be considered as belonging to the household rather than to the farm).
- The rental value of the dwelling.

The balance of this account will represent either a net withdrawal or a net additional investment by the farmer. If the debit side is the larger the balance will represent a net withdrawal and should be transferred to the debit side of the Proprietor account; if the credit side is the larger the balance will represent a net additional investment and should be transferred to the credit side of the Proprietor account.

#### Credit this account with

- The value of the proprietor's labor, which is spent in the operation of the farm.
- The value of the labor spent in the operation of the farm by members of the household who do not receive wages.
- The value of the board and lodging of all day and rate laborers. (See Day Labor and Rate Labor accounts.)
- All income from the sale of garden produce.
Operating Accounts.

(1).

Field No. 1. Corn 1912.

Debit this account with

All direct costs incurred in raising corn on field No. 1, such as seed, etc.

At the end of each month with the extra labor and regular labor spent on this field. This will be determined from the labor record. (At this time credit the extra labor and Regular Labor accounts).

At the end of the year with the share of the balances of the following accounts which are assignable to Field No. 1. Team Expense, Corn Machinery Expense, All Crop Machinery Expense, Miscellaneous Machinery Expense, Insurance, Taxes, Buildings Expense, Fertilizer, and General Expense.

The interest on the value of the land in Field No. 1. (At this time credit the Interest on Investment account).

Credit this account with

All sales of corn produced on this field.

The value of all corn produced on this field that is used on the farm for seed, feed, etc.

At the end of the crop season with the value of the corn produced on this field remaining on hand. (At this time debit the Corn Inventory account).

The balance of this account will represent the gain or loss resulting from the raising of corn on Field No. 1. If the debit side is the larger, the balance will represent a loss and should be transferred to the debit side of the Profit and Loss account; if the credit side is the larger, the balance will represent a gain and should be transferred to the credit side of the Profit and Loss account.

Note: If it is desired to know the cost of producing corn per bushel, the total number of bushels produced on this field should be divided into the total cost which is represented by the total of the debit side of this account. If the cost per acre is desired the total number of acres in this field should be divided into the total cost of producing the corn.
Debit this account with

All direct costs incurred in raising wheat on Field No. 2, such as seed, etc.

At the end of each month with the extra labor and regular labor spent on this field. This will be determined from the Labor record. (At this time credit the Extra Labor and Regular Labor accounts).

At the end of the year with the share of the balances of the following accounts which are assignable to Field No. 2; Team Expense, Grain Machinery Expense, All Crop Machinery Expense, Insurance, Taxes, Building Expense, Fertilizer, Miscellaneous Machinery Expense, and General Expense.

The interest on the value of the land in Field No. 2. (At this time credit the Interest on Investment Account).

Credit this account with

All sales of wheat produced on this field.

The value of all wheat produced on this field that is used on the farm.

At the end of the crop season with the value of the wheat produced on this field remaining on hand, (At this time debit the Wheat Inventory account).

The balance of this account will represent the gain or loss resulting from the raising of wheat on Field No. 2. If the debit side is the larger, the balance will represent a loss and should be transferred to the debit side of the Profit and Loss account; if the credit side is the larger, the balance will represent a gain and should be transferred to the credit side of the Profit and Loss account.

Note: If it is desired to know the cost of producing wheat per acre, the total number of acres in Field No. 2 should be divided into the total cost of producing the wheat which is represented by the debit side of this account; if the cost of producing wheat per bushel is wanted, the total number of bushels produced on Field No. 2 should be divided into the total cost of producing the wheat.
Debit this account with:

All direct costs incurred in raising oats on Field No. 3, such as seed, etc.

At the end of each month with the extra and regular labor spent on this field. This will be determined from the labor record. (At this time credit the Extra Labor and Regular Labor accounts).

At the end of the year with the share of the balances of the following accounts which are assignable to Field No. 3: Team Expense, Grain Machinery Expense, Miscellaneous Machinery Expense, All Crop Machinery Expense, Buildings Expense, Insurance, Taxes, Fertilizer, and General Expense.

The interest on the value of the land in Field No. 3. (At this time credit the Interest on Investment account).

The balance of this account will represent the gain or loss resulting from the raising of oats on Field No. 2. If the debit side is the larger the balance will represent a loss and should be transferred to the debit side of the Profit and Loss account; if the credit side is the larger, the balance will represent a gain and should be transferred to the credit side of the Profit and Loss account.

Credit this account with:

All sales of oats produced on this field.

The value of all the oats produced on this field that is used on the farm.

At the end of the crop season with the value of the oats produced on this field remaining on hand. (At this time debit the Oats Inventory account).

The interest on the value of the land in Field No. 3.

Note: If it is desired to know the cost of producing oats per acre, the number of acres in Field No. 3 should be divided into the cost of producing the crop which is represented by the total of the debit side of this account; if the cost of producing oats per bushel is wanted, the total number of bushels of oats produced on this field should be divided into the cost of producing the oats.
Debit this account with

All direct costs incurred in raising timothy on Field No. 4, such as seed, etc.

At the end of each month with the extra and regular labor spent on this field. This will be determined from the labor record. (At this time credit the Extra Labor and Regular Labor accounts).

At the end of the year with the share of the balances of the following accounts which are assignable to Field No. 4; Teams Expense, Hay Machinery Expense, All Crop Machinery Expense, Miscellaneous Machinery Expense, Insurance, Taxes, Buildings Expense, Fertilizer, and General Expense.

The interest on the value of the land in Field No. 4. (At this time credit the Interest on Investment account).

The balance of this account will represent the gain or loss resulting from the raising of timothy on Field No. 4. If the debit side is the larger, the balance will represent a loss and should be transferred to the debit side of the Profit and Loss account; if the credit side is the larger, the balance will represent a gain and should be transferred to the credit side of the Profit and Loss account.

Note: If it is desired to know the cost of producing timothy per acre, the number of acres in Field No. 4 should be divided into the cost of producing the timothy which is represented by the debit side of this account; if the cost per ton is desired the total number of tons produced should be divided into the cost of producing the timothy.

Credit this account with

All sales of timothy produced on this field.

The value of all timothy produced on this field that is used on the farm.

At the end of the crop season with the value of the Timothy produced on this field remaining on hand. (At this time debit the Timothy Inventory account).
Debit this account with

All direct costs of preparing this field for pasture.

At the end of each month with the extra and regular labor spent on this field. This will be determined from the Labor record. (At this time credit the Extra Labor and Regular Labor accounts).

At the end of the year with the share of the balances of the following accounts assignable to this field: Teams Expense, All Crop Machinery Expense, Miscellaneous Machinery Expense, Hay Machinery Expense, Insurance, Taxes, Fertilizer, Buildings Expense, and General Expense.

The interest on the value of the land in Field No. 5. (At this time credit the Interest on Investment account).

Credit this account with

All income that may be secured from this field, as, for example, rental for pasturage.

An amount representing the value of the pasturage to the livestock of the farm.

The balance of this account will represent the gain or loss resulting from the operation of this field as a pasture. If the debit side is the larger, the balance will represent a loss and should be transferred to the debit side of the Profit and Loss account; if the credit side is the larger, the balance will represent a gain and should be transferred to the credit side of the Profit and Loss account.
(6).

Feeding Cattle.

Debit this account with

The cost of all cattle bought for feeding purposes.

The value of all feed purchased for these cattle.

The value of all farm products and pasturage used as feed for these cattle.

The share of the balances of the following accounts properly assignable to these cattle: Extra Labor, Regular Labor, Teams Expense, Buildings Expense, Insurance, Taxes, and General Expense.

All expense incurred in putting these cattle on the market.

The interest on the investment in these cattle, estimated for the time such investment is made. (At this time credit the Interest on Investment account).

Credit this account with

All sales of feeding cattle.

At the end of the year with the cost price of the feeding cattle on hand. (After the account has been closed for the year, this amount should be transferred to the debit side of the new account for the coming year).

The balance of this account will represent the gain or loss resulting from the feeding of cattle for market purposes. If the debit side of this account is the larger, the balance will represent a loss and should be transferred to the debit side of the Profit and Loss account; if the credit side is the larger, the balance will represent a gain and should be transferred to the credit side of the Profit and Loss account.
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Dairy Operating.

Debit this account with
All direct expenses incurred in operating the dairy, such as cash purchases of feed, farm products used as feed, pasture, dairy supplies, etc.
The cost of manufacturing and marketing dairy products.
The share of the balances of the following accounts properly assignable to this account; Extra Labor, Regular Labor, Teams Expense, Dairy Machinery Expense, Miscellaneous Machinery Expense, Buildings Expense, Insurance, Taxes, and General Expense.
The depreciation on the dairy cows. This will be secured from the Dairy Cattle account.
The interest on the Investment in Dairy Cattle. (At this time credit the Interest on Investment account).

Credit this account with
All sales of dairy products, such as milk, cream, butter, cheese, etc.
The value of all dairy products used in the household.
The value of all dairy products used on the farm as feed for hogs, poultry, etc.
The sales of all calves of the dairy cattle.
The value of all calves of dairy cows that are kept on the farm as a part of the dairy herd. (At this time debit the Dairy Cattle account)
The value of all manure produced by dairy cattle.

The balance of this account will represent the gain or loss resulting from the operation of the dairy. If the debit side is the larger, the balance will represent a loss and should be transferred to the debit side of the Profit and Loss account; if the credit side is the larger, the balance will represent a gain and should be transferred to the credit side of the Profit and Loss account.
## Hogs Operating

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The value of all hogs on hand at the beginning of the year.</td>
<td>All sales of hogs.</td>
</tr>
<tr>
<td>The value of all hogs purchased.</td>
<td>The value of all hogs used in the household.</td>
</tr>
<tr>
<td>All cash purchases of feed for hogs, all farm products used as feed, all other direct expenses incurred in raising hogs.</td>
<td>At the end of the year with the value of the hogs on hand. After the account has been closed for the year this amount should be transferred to the debit side of the new account for the coming year.</td>
</tr>
<tr>
<td>The share of the balances of the following accounts properly assignable to this account: Extra Labor, Regular Labor, Teams Expense, Buildings Expense, Insurance, Taxes, and General Expense.</td>
<td>The interest on the investment in hogs, estimated for the time of such investment. (At this time credit the Interest on Investment account.)</td>
</tr>
</tbody>
</table>

The balance of this account will represent the gain or loss on hogs. If the debit side is the larger, the balance will represent a loss and should be transferred to the debit side of the Profit and Loss account; if the credit side is the larger the balance will represent a gain and should be transferred to the credit side of the Profit and Loss account.
Poultry Operating.

Debit this account with:

- The value of all poultry on hand at the beginning of the year.
- The value of all poultry purchased.
- All cash purchases of feed for poultry, all farm products used for poultry feed, all other direct expenses incurred in connection with the poultry.
- The share of the balances of the following accounts properly assignable to this account: Extra Labor, Regular Labor, Teams Expense, Buildings Expense, Insurance, Taxes, and General Expense.
- The interest on the investment in poultry. (At this time credit the Interest on Investment account).

Credit this account with:

- All sales of poultry and poultry produce.
- The value of all poultry and poultry produce used in the household.
- At the end of the year with the value of the poultry on hand. After the account has been closed for the year this amount should be transferred to the debit side of the new account for the coming year.

The balance of this account will represent the gain or loss on poultry. If the debit side is the larger, the balance of the account will represent a loss and should be transferred to the debit side of the Profit and Loss account; if the credit side is the larger the balance of the account will represent a gain and should be transferred to the credit side of the Profit and Loss account.
### Sheep Operating

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>The value of all sheep on hand at the beginning of the year.</td>
<td>All sales of sheep.</td>
</tr>
<tr>
<td>The value of all sheep purchased.</td>
<td>All sales of wool.</td>
</tr>
<tr>
<td>All cash purchases of feed for sheep, all farm products used as feed for the sheep, pasturage, all other direct expenses incurred in connection with the sheep.</td>
<td>All sheep used in the household.</td>
</tr>
<tr>
<td>The share of the balances of the following accounts assignable to this account: Extra Labor, Regular Labor, Teams Expense, Buildings Expense, Insurance, Taxes, and General Expense.</td>
<td>At the end of the year with the value of the sheep on hand. After the account has been closed for the year, this amount should be transferred to the debit side of the account for the coming year.</td>
</tr>
</tbody>
</table>

The interest on the Investment in sheep, estimated for the time of such investment. (At this time credit the Interest on Investment account).

The balance of this account will represent the gain or loss on sheep. If the debit side is the larger, the balance will represent a loss and should be transferred to the debit side of the Profit and Loss account; if the credit side is the larger the balance will represent a gain and should be transferred to the credit side of the Profit and Loss account.
(11).

**Orchard Operating.**

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>All direct expenses incurred in operating the orchard, such as barrels, crates, etc. for marketing.</td>
<td>All income from the sale of fruit from the orchard.</td>
</tr>
<tr>
<td>All cost of trees purchased to keep up the orchard.</td>
<td>The value of all fruit from the orchard used in the Household. (At this time debit the Household account).</td>
</tr>
<tr>
<td>All Extra and Regular labor spent on the orchard as shown by the labor record. (At this time credit the Extra Labor and Regular Labor accounts).</td>
<td></td>
</tr>
<tr>
<td>All team labor spent on the orchard as shown by the Team Record. (At this time credit the Teams Expense account).</td>
<td></td>
</tr>
<tr>
<td>The interest on the value of the Orchard and of the land in the orchard. (At this time credit the Interest on Investment account).</td>
<td></td>
</tr>
</tbody>
</table>

The balance of this account will represent the loss or gain resulting from the operation of the orchard. If the debit side is larger the balance will represent a loss and should be transferred to the debit side of the Profit and Loss account; if the credit side is the larger, the balance will represent a gain and should be transferred to the credit side of the Profit and Loss account.
(12). Ensilage.

Debit this account with

The value of all corn used for the purpose of ensilage. (This will include the same items that are contained in the Corn Operating account).

Interest on the investment in the silo, depreciation and repairs of the silo, interest on the investment in ensilage machinery, depreciation and repairs of ensilage machinery, and cost of operating the ensilage machinery.

The purpose of this account is to determine the cost of ensilage and to distribute its cost among the various live stock accounts.

Credit this account with

The value of the ensilage fed to the live stock. At this time debit the various live stock accounts. (The amounts fed to the different kinds of live stock will be determined from the feeding record).

Miscellaneous Income.

(13).

Debit this account at the end of the year with the balance of the account. (At this time credit Profit and Loss account).

Credit this account with

All miscellaneous income.
### Interest on Investment

<table>
<thead>
<tr>
<th>Debit this account with</th>
<th>Credit this account with</th>
</tr>
</thead>
<tbody>
<tr>
<td>At the end of the year with the credit balance of this account. (At this time credit the Profit and Loss account).</td>
<td>The interest on the investment in the different forms of farm capital as shown by the following accounts: Teams Expense, Buildings Expense, Corn Machinery Expense, Hay Machinery Expense, Grain Machinery Expense, Dairy Machinery Expense, All Crop Machinery Expense, Miscellaneous Machinery Expense, Field No. 1, Field No. 2, Field No. 3, Field No. 4, Field No. 5, Feeding cattle, Dairy Operating, Hogs Operating, Poultry Operating, Sheep Operating, Ensilage, Orchard Operating.</td>
</tr>
</tbody>
</table>

The balance of this account, which will be transferred to the Profit and Loss account as indicated above, will represent the interest on the investment in farm capital which has been charged to the various operating accounts as an item in the cost of operating the farm.
Debit this account with

The debit balances of the following accounts: Interest and Discount, Marketing Expense, Field No. 1, Field No. 2, Field No. 3, Field No. 4, Field No. 5, Feeding Cattle, Dairy Operating, Hogs, Operating, Poultry Operating, Sheep Operating, and all other operating accounts which may be kept.

The debit balances of the inventory accounts.

All losses on assets incurred during the year, such as
(a) Losses due to the sale of assets for less than the inventory value.
(b) Losses due to the destruction of assets by fire, etc., not covered by insurance.
(c) Losses due to the death of teams or dairy cattle.

Credit this account with

The credit balances of the following accounts: Interest and Discount, Marketing Expense, Field No. 1, Field No. 2, Field No. 3, Field No. 4, Field No. 5, Feeding Cattle, Dairy Operating, Hogs, Operating, Poultry Operating, Sheep Operating, and all other operating accounts.

All profits accruing from the sale of assets, e.g. when assets are sold for an amount greater than the amount at which they had been carried in the inventory.

The credit balances of the inventory account.

The balance of the interest on Investment account.

The balance of the Miscellaneous Income account.

The rental value of the farmer's dwelling and the houses of farm laborers who live on the farm.

If the credit side of this account is the larger, the balance will represent the net gain of the farm for the year and it should be transferred to the credit side of the Proprietor account; if the debit side of the account is the larger, the balance will represent a net loss and should be transferred to the debit side of the Proprietor account.
Chapter VI.

THE VALUATION AND DEPRECIATION
OF THE FIXED ASSETS.

THE VALUATION OF THE LAND.

The valuation of the assets of the farm constitutes one of the most difficult problems in farm accounting. The greater part of the value of the fixed assets is in the form of land. One of the first things the accountant must do is to decide upon a basis for the valuation of the land.

There are three bases which may be considered:
1. The purchase or cost price of the land.
2. The capitalized earning power of the land.
3. The market price of the land.

Accountants, as a rule, prefer to value fixed assets, and especially land, according to the first basis, i.e. the actual cost of the land.\(^1\) One reason advanced for this is that a gain should not be entered on the books until it is realized in an actual transaction. If the value of the land should be written up on the books, the proprietor's account would need to be written up correspondingly. This would indicate a gain although no trans-

action had actually taken place. Another reason is that the inventory of fixed assets should be made up on the basis of their value to the business as a "going concern". This value is best indicated by the value at the time of purchase, and does not vary directly with changes in the market price.

If farm land varied but slightly in its market value, or if the market value were subject to uncertain fluctuations, the same rule would be the best to apply in this case. This, however, is not the true situation. Changes in the value of farm land are almost always in one direction, namely upward, and the movement is apt to be a steady one. Likewise, the change in value is often so great that to continue to value the land on the books at its cost price is to misrepresent the true investment of the farmer, both with respect to the total investment and to the proportions in which the different forms of farm capital are combined.

It is also important that the farmer's gains from the operation of his farm be kept distinct from the gains resulting from the increase in the land value. If the land is carried on the books at its cost price when its market price is much higher, the true interest on the investment in land, which is an item properly to be included in the cost of operating the farm, cannot be obtained. As a consequence, the operating profits will
appear larger than they actually are, which is due to the fact that the gain resulting from the so-called unearned increment has been confused with the gain resulting from the operation of the farm. This will be made clear by the following illustration.

Let us assume two farmers, A and B, who are engaged in farming under exactly similar conditions, with the exception that A, who purchased his land ten years ago, values it at $100 an acre which was the price he paid for it at that time, whereas B, who purchased his land one year ago, values it at $200 an acre which was the price he paid for it. The producing power of the land, however, is the same. According to our assumption, the cost of operating the farm in each case will be the same except for the interest on the investment in the land. If the cost of producing corn, not including the interest on the value of the land, is $7 an acre, it is evident that if we include interest at 5% the cost for A will be raised to $12 an acre and the cost for B will be increased to $17 an acre. The $5 an acre difference is not due to a difference in the efficiency of operation nor to a difference in the productivity of the land, but is merely the interest on the gain resulting from an increase in land values in the community.

The capitalized earning power of the land is also open to objections as a basis for the valuation of the land.
The real earning power of the land is a factor depending upon so many variables that it is almost impossible to determine it accurately.\(^1\) The character of the season, the kinds of crops raised, the intensiveness or extensive-ness of cultivation, the efficiency of operation of the farm all have an influence in determining the earning power of the land.

The market price of the land as determined by the sale of land in the immediate locality, or by the actual offers of buyers for the land, is probably the best basis of valuation, although it also is not wholly free from objections.\(^2\) It has the advantage of furnishing a correct comparison of the investment in the different forms of farm capital. It furnishes a correct basis for ascertaining the true cost of operating the farm, and thus keeps the operating gains separate from the gains due to increases in land values. The principal criticism to be made of this basis is its relativity. The factors combining to determine the price a buyer may be willing to pay for a piece of land are various, and hardly ever the same in the case of two different pieces of land. Personal interests are often involved in the price for which a piece of land is sold. This objection, however, is not a very practical one if average

\(^1\)Laur, E. Grundlagen und Methoden der Bewertung, Buchhaltung, und Kalkulation in der Landwirtschaft. p. 37.

sales in the locality are used as a basis rather than any one particular sale.

A writing up of the value of the land should, under any circumstances, be done conservatively, and only after it is certain that the rise in land value is permanent.

LAND IMPROVEMENTS.

In handling the land account on the books a considerable difficulty presents itself in the form of the improvements other than the buildings. Some prefer to keep the improvements separate from the land in the accounts, but the advantage of such a practice is questionable. The value of the improvements is always merged with the value of the land to such an extent that any separation will, of necessity, be a highly arbitrary one. There is also no advantage in keeping the two separate for the purpose of estimating the depreciation, as all repairs or replacements of land improvements should be charges as current expense, and these will take the place of depreciation by virtually replacing the improvement from time to time.

When improvements are being made it is a good practice to open separate accounts temporarily until the improvement has been completed and the total cost of the same ascertained, then to close the account into the land account.

In the matter of improvements it is not safe to
lay down any general rule, but a careful study should be made of each case. In general, all improvements may be grouped under some one of the following heads: (1)

1. Drains.
2. Wells, water facilities. (Windmills, etc.)
3. Orchards.
4. Fences.
5. Roads.
6. Fertility.

DRAINS.

Under this head would be included principally tilling, drainage ditches, etc., where permanent tilling is done, the value of the land is permanently increased to an extent appreciably greater than the actual cost of the tilling. In view of that fact it is proper and in accord with conservative accounting principles to write up the value of the land by charging the cost of tilling to the Land account. Any repairs or replacements of tiling already installed, on the other hand, should be considered a current expense and be entered on the books as such.

WATER FACILITIES.

Good water facilities likewise add to the value of the farm as a whole, although this is not so true as a general principle as is the increase in value due to the installation of a good drainage system. If it is evident

(1) Card, F.W. Farm Management. p. 149.
that the value of the farm has been increased by the
digging of wells, it is proper to charge their cost to
the Land account, thus writing up the value of the land.
If there is any question, however, it is better to con­sider the cost of the wells an expense and to treat it so
on the books. This is the more conservative position to
take at all times, and therefore probably also the wiser.
It is unfair to charge all the expense of new wells to any
one year, so a deferred asset account should be opened
and a certain portion of this be written off each year,
thus spreading the expense over a number of years.

Windmills and other pumping devices should be
treated separately. Usually it will be advisable to
open an account with these which should be debited for
the original cost, including the cost of construction or
installation. A fair rate of depreciation should be
charged off each year as in the case of the other mech­
nical equipment.

ORCHARDS.

Orchards furnish the farm accountant with a
perplexing problem. In most cases an orchard adds to
the value of the farm, but this is not invariably true.
Likewise the increase in value is not necessarily a per­
manent one. The extent of the increase as well as its
permanency will depend upon the character of the orchard
and the care it receives, therefore it is not safe to lay
down a general rule. In the case of a young growing orchard it is wise to open a special account. This account should be charged with the original cost of the trees and planting, together with the annual cost of care until the orchard has reached maturity. (1). This places a conservative value on the orchard. If the orchard is properly kept up it should not depreciate in value and the balance of this account should remain the same. All replacements of trees as well as the cost of care after the orchard has reached maturity should be treated on the books as current expense. If the orchard is important enough a separate operating account may be opened for it which is debited with all orchard expense and credited with all orchard income.

FENCES.

There are relatively few cases in which fencing should be considered other than as a farm expense. (2)

In the case where a run-down farm is being built up it is not proper to charge the entire cost of fencing to one year, as this would make that year appear at a dis-
advantage in comparison with the preceding and succeeding years. The more nearly the accountant succeeds in charging the expense to the period in which it properly belongs the more valuable for purposes of comparison will be the information furnished by his accounts. This distribution of the fencing expense over a longer period can be secured, as was suggested above in the case of water facilities, by opening up a deferred asset account and then charging off a certain amount to the profits of each year. When the fencing expense consists merely of repairs and replacements it will be found satisfactory to treat it as current expense to be taken out of the profits of the current year.

ROADS.

There are two classes of roads which the farm accountant must take into consideration.

1. Public roads adjoining the farm.
2. Private roads within the farm limits.

Specially constructed or hard roads (macadamized, concrete, etc.) add materially to the value of the property adjoining them. Usually they are constructed by the township, county, or state. In that event they should be considered only indirectly in connection with the farm accounts, i.e. as one of the factors having an influence in determining the value of the land. On the other hand
where the cost of construction is borne wholly or in part by the owners of the abutting property the roads should be given direct consideration in the farm accounting system. In this event the cost of the roads should be entered as a debit in the Land account, thus conservatively assuming the value of the land to have been directly increased to the extent of the cost of improvement.

Good roads within the farm limits also add to the value of a farm, yet the extent to which this is true varies so much in different instances, being dependent upon so many variable factors, that the safest plan is to consider farm roads of this class an expense and to treat their cost as such on the books. If any permanent construction of roads within the farm is undertaken at considerable cost, or expensive improvements are made, as in the case of bridges, etc., the expense should be distributed over a number of years by means of a deferred charge to Profit and Loss.

FERTILITY.

There can be no question concerning the importance of the fertility of the soil but also as to its intangibility for valuation purposes. (1) To give it a separate value is practically out of the question.

There are two phases in which fertility of the soil may be considered.

1. Maintenance of fertility.
2. Building up or creation of fertility.

The cost of maintaining the fertility of the soil by means of the application of fertilizer, the raising of leguminous crops, etc., is properly to be considered an expense. The distribution of this expense will be considered in another connection (See Fertilizer account).

The situation is different in the case of a farm where a definite attempt is made to build up the fertility of the soil. If the value of the land as shown on the books will be increased by the application of fertilizer to the soil, it is proper to consider the cost of such improvement as a capital expenditure rather than as an expense, and to charge this cost to the Land account, thus raising the value of the land on the books by that amount. Whenever this is done, there should always be some tangible evidence of the increased value of the land in the form of larger crop yields or otherwise.

THE SEPARATION OF LAND AND BUILDINGS.

It will seem at first thought a very difficult thing to separate the value of the land and the buildings, as ordinarily this is not done. The usual purchase price of a farm includes both land and buildings with no separation of values. There are several reasons, however, why they should be separated.

1. It is important for the purposes of good farm management
that the farmer should know how much capital he has invested in every class of equipment. Buildings comprise one of these classes and therefore they should be given a value separate from the land even though this value in many cases is only an approximation.

2. The depreciation of buildings is an important item in the cost of operating the farm. This depreciation can be accurately estimated only when the value of the buildings is known. (1).

3. An important problem in farm management is the selection of the most advantageous type of buildings. In order to solve such a problem intelligently it is necessary among other things to know the comparative cost of maintaining the various types of buildings. The cost of maintenance of a building consists of repairs, depreciation, and interest on the investment. In the case of expensive buildings the depreciation and the repairs will be small but the interest on the investment will be high; in the case of inexpensive buildings the depreciation and the repairs will be high but the interest on the investment will be small. (2). Only by knowing definitely the value of the buildings can the cost of maintenance be accurately ascertained.

BUILDINGS.

The buildings should be valued as nearly as possible on the basis of cost. (3). Where the purchase price of the farm makes no provision for a separate value for buildings and the original cost cannot be ascertained, an approximate valuation will be necessary.

In the case of new buildings the cost principle will be easily applied. When new buildings are constructed it is a good plan to open up a construction account for the same. All items entering into the cost of buildings, including materials, labor etc., should be charged to this account. After the building has been completed the balance of this account should be transferred to the debit side of the Buildings account, thus entering the cost of the new building or the improvement in that account in one amount. Much confusion will be avoided if this plan is followed.\(^{(1)}\).

**THE DEPRECIATION OF BUILDINGS.**

Depreciation is the decline in the value of an asset and may be due to various causes.\(^{(2)}\). For assets in general some of the commonly recognized causes of depreciation are:

1. Wear and tear.
2. Lapse of time.
3. Obsolescence.
5. Hostile legislation.
6. Undesirable environment.

With respect to farm buildings only two of these causes need to be considered. The most important is the wear and tear resulting from the use of the building and its exposure to weathering conditions, but obsolescence may also prove to be a factor.

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\(^{(2)}\) Lisle, Geo. Accounting in Theory and Practice. p.137.
making for the depreciation of farm buildings. The value of a building may grow less because of changing farm conditions. The buildings, although in good physical condition may no longer be adapted to the particular needs of the farm and may have to be replaced by a different type of building capable of giving more efficient service. (1).

There are numerous methods which may be employed in estimating the depreciation of assets(2) of which the following are the only ones of importance in the case of farm assets:

1. Make a physical revaluation at the end of each fiscal period.
2. Estimate the life of the asset and charge off a fixed amount at the end of each fiscal period.
3. Estimate the life of the asset and charge off an amount at the end of each fiscal period which decreases in proportion as the value of the asset decreases.

The first of these methods is impractical in the case of farm buildings as it is impossible to determine by means of a physical revaluation the actual amount of the decline in the value of a building due to wear and tear or to obsolescence.

The second method is to be commended because it is simple and therefore easily applied. According to this plan the annual amount of depreciation is found by dividing the difference

(1) Laur,E. Grundlagen und Methoden der Bewertung, Buchhaltung und Kalkulation in der Landwirtschaft. p.97-98.
(2) See Webner,F.E.-Factory Costs for a discussion of methods of estimating depreciation.
between the original value of the buildings and its residual value by the number of years it is estimated to be capable of giving service. The residual value of a building would be the value of the material in it at the end of its period of service. If a building is originally worth $1100, its residual value is estimated to be $100, and its probable life is 25 years, an annual amount equal to 1/25 of $1000, or $40, should be charged off for depreciation, that is,

Let \( V \) = Original Value.
" \( R \) = Residual Value.
" \( n \) = Life of Asset in Years.
" \( D \) = Annual Depreciation.

Then

\[
D = \frac{V - R}{n}.
\]

The theory underlying the third method is that it tends to an equal distribution of maintenance costs over the fiscal periods constituting the life of the asset. It is assumed that in the early periods the charges for repairs and renewals will be small and this should be offset by a heavy charge for depreciation. In the later periods of the life of the asset when the charges for repairs and renewals begin to mount up the charge for depreciation should accordingly diminish.

This method may be applied in two ways:

1. By a uniform percentage rate based upon the declining value of the asset.
2. By a variable percentage rate based upon the total amount to be written off during the life of the asset.
Elaborate mathematical formulas have been worked out for ascertaining a uniform percentage rate which when based on the declining value of the asset will result in yearly charges for depreciation sufficient to write off the value of the asset during its life. A variable percentage rate, however, may be secured by means of simple arithmetic. Since individual judgment enters so largely into the problem this second plan is probably just as accurate in its final results as the first, and it is therefore the better one to use. It should always be borne in mind that carefully devised formulas cannot remove inaccuracies which are due to errors in judgment. The plan is as follows:

The fraction representing the proportion of the value of the asset to be charged off for depreciation each year has for its numerator the number of years of life the asset has yet to run and for its denominator the sum of the year numbers constituting the life of the asset. For example: if the value of a building is $600, its residual value is estimated to be $50, and its life is estimated at 10 years, the annual charges for depreciation would be as follows:

<table>
<thead>
<tr>
<th>Year</th>
<th>Depreciation</th>
<th>Value of asset</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>10/55 of 550 = 100.</td>
<td>500.</td>
</tr>
<tr>
<td>2</td>
<td>9/55 of 550 = 90.</td>
<td>410.</td>
</tr>
<tr>
<td>3</td>
<td>8/55 of 550 = 80.</td>
<td>330.</td>
</tr>
<tr>
<td>4</td>
<td>7/55 of 550 = 70.</td>
<td>260.</td>
</tr>
<tr>
<td>5</td>
<td>6/55 of 550 = 60.</td>
<td>200.</td>
</tr>
<tr>
<td>6</td>
<td>5/55 of 550 = 50.</td>
<td>150.</td>
</tr>
<tr>
<td>7</td>
<td>4/55 of 550 = 40.</td>
<td>110.</td>
</tr>
</tbody>
</table>
8. \( \frac{3}{55} \) of 550 = 30.

9. \( \frac{2}{55} \) of 550 = 20.

10. \( \frac{1}{55} \) of 550 = 10.

No uniform rate can be fixed for the depreciation of farm buildings, therefore the wisest plan is to consider each building separately. The amount of depreciation will vary greatly depending upon such things as the character of the construction of the building, the promptness and adequacy of repairs, and the use to which the building is put. For the more substantial farm buildings it is generally estimated that 3% will be a fair annual allowance for depreciation; in the case of the buildings of cheaper construction the rate will probably rise as high as 5%.(1)

It should always be kept in mind that the depreciation charge under all circumstances is only an approximation and if with the lapse of time the charge is found to be either too large or too small a correction should be made.(2)

REPAIRS AND IMPROVEMENTS OF BUILDINGS.

It is impossible to lay down any fixed rule for distinguishing between repairs and improvements in the case of buildings. Much will have to be left to the judgment of the individual in this respect. In general, an improvement is considered to add to the value of the building, whereas a repair merely ser-

(2) Laur,E. Grundlagen und Methoden der Bewertung, Buchhaltung und Kalkulation in der Landwirtschaft. p. 98.
ves to maintain its value in whole or in part. To illustrate: if a building is painted for the first time it would be considered an improvement; if painted for the second time it would be looked upon as a repair. Small items, for example under $25, should always be considered repairs even though it may seem that they are in the nature of improvements. Unless this is done the book value of the building may very easily become inflated through a large number of comparatively insignificant items.

THE DWELLING.

There is a question with respect to whether or not the farmer's dwelling should be included in the capital investment of the farm. The position may be taken that the dwelling should not be so included, except in so far as certain parts of it may be used for distinctly farm purposes. The profitableness of the farm is in no manner affected whether the farmer lives in a one thousand dollar house or whether he lives in a ten thousand dollar house. (1) In so far as this relates to the personal expenditures of the farmer it is true. The profitableness of the farm is entirely independent of the character and amount of the farmer's household expenses. Changes in the farmer's household expenses ought not to have any influence on the operation of the farm any more than that a merchant's household expenses should help to determine the rate of profitableness of his business.

But the expense of maintaining the dwelling is not distinctly a household expense. The dwelling and the farm are, for all practical purposes, inseparable. If the farmer wishes to purchase a farm he must purchase the dwelling together with the land. There is no choice in the matter. The dwelling, thus, is included in the investment as much as are the buildings used definitely for farm purposes, and the expense of maintaining the dwelling in good repairs, as well as the depreciation and the interest on the investment in the dwelling are properly farm operating expenses.

Since the dwelling is used for the farmer's personal purposes, he should be charged a reasonable amount for rental, (1) and this rental should be credited to farm income. The rental should always be sufficient to cover all expenses incurred in connection with the dwelling, such as repairs, depreciation, and interest on the investment.

MACHINERY.

1. THE CLASSIFICATION OF MACHINERY.

The distribution of machinery costs over the various enterprises or departments of the farm will be made simpler and also more accurate by dividing the machinery into classes. The character of the machine or implement and the use to which it is put should form the basis of this classification. The following classification, used by the Minnesota Agricultural Experiment Station.

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Station in its investigations of the cost of producing farm products in Minnesota is a very practicable one. (1).

1. Corn machinery. Implements and machines used exclusively in the production of corn, such as planters, cultivators, binders, etc.

2. Grain machinery. Implements and machines used exclusively in the production of cereal grains, such as drills, binders, reapers, fanning mills, etc.

3. Hay machinery. Implements and machines used exclusively in the production of hay, such as mowers, rakes, forks, etc.

4. Dairy machinery. Implements and machines used exclusively in the production of dairy products, such as separators, churns, etc.

5. All Crop machinery. Implements and machines used generally in the production of all farm products, such as plows, harrows, wagons, etc.

6. Miscellaneous machinery. Implements and machines not belonging to any of the above classes, such as power machinery, traction engines, etc.

THE VALUATION OF MACHINERY.

There are three possible bases for the valuation of farm machinery. (2). These are:


Krafft, G. Die Betriebslehre, p. 212.

Laur, E. Grundlagen und Methoden der Bewertung, Buchhaltung und Kalkulation in der Landwirtschaft, p. 54.
1. The cost price.
2. The selling price.
3. The value for service.

By cost price is meant the purchase price. It should not include the cost of repairs or of apparent improvements, for only under exception circumstances do these add enough to the value of the machine to warrant carrying it on the books at an increased value. At the most they merely serve to retard the depreciation of the machine.

Farm machinery should always be valued from the standpoint of the farm as a going concern. Under these circumstances the first basis will be the most satisfactory. The selling price and the value for service, however, are important items to be taken into account in estimating the depreciation, so that as a matter of fact all three bases must be considered in the valuation of the machinery which has been a part of the farm equipment for some time.

THE DEPRECIATION OF MACHINERY.

A general rate of depreciation is not practicable for farm machinery. The rate of depreciation of all classes of machinery will not be the same on any two farms and the rate of depreciation of separate items will vary even more widely.

(2) Laur, E. opus cit. p. 108.
(3) Warren, E. Farm Management p. 158.
Some of the factors combining to determine the rate are as follows:

1. The character of the implement.
2. The amount of its use.
3. The intelligence displayed in handling it.
4. The care it receives when idle.
5. The promptness and adequacy of repairs when needed.

Statistics collected by the Minnesota Agricultural Experiment Station show that the average annual depreciation of all classes of farm machinery is about 7.3%. Most writers on the subject consider 10% a safe average rate. A general rate of depreciation, however, does not permit of an accurate distribution among the various crops. Each machine or implement should be considered separately and whenever it is possible the assistance of an expert in farm machinery should be secured. As a guide in estimating the depreciation of machinery, the following table taken from Bulletin No. 73 of the Bureau of Statistics, U. S. Department of Agriculture, may be useful.

(1) Card, F. W. Farm Management. p. 158.
(3) Card, F. W. Farm Management. p. 158.
Krafft, G. Die Betriebslehre. p. 212.
Annual depreciation in value of farm machinery expressed in percentage.

<table>
<thead>
<tr>
<th>Machine.</th>
<th>Percent</th>
<th>Percent</th>
<th>Percent</th>
<th>Percent</th>
<th>Percent</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>:North- :Marshall Halstad :640-acre Ave. :</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>:field :Lyon : (Nor- :acre : farm : all : Co.) :</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>: (Rice : Co.) : man CO : farm : : (Stevens mach- : Co.) :</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Grain binders 8.33 9.44 7.47 6.56 10.57 7.91
Grain drills & seeders. 7.27 8.07 6.52 4.36 6.47 6.75
Thrashing outfit 12.00 12.00
Corn binders 11.46 10.16 11.40 9.00 10.03
Corn planters 6.74 8.54 6.53 4.36 7.15
Corn cultivators 6.67 9.04 6.97 4.66 7.25
Mowers 7.25 10.01 6.97 7.28 7.60
Hay tedders 4.84 4.84
Hay loaders 11.78 11.78
Hay rakes 7.60 7.51 8.46 5.81 5.00 7.91
Gang plows 10.51 7.16 6.69 8.46 6.71 7.15
Walking plows 10.27 11.93 5.77 3.70 8.42
Walking plows 4.77 7.29 7.64 8.82 6.09
Wagons 6.66 4.86 5.44 2.47 5.00 4.89
Harrows 11.01 8.20 7.93 8.39 6.78 8.49
Disks 5.43 7.46 3.69 5.00 5.19
Manure spreaders 10.50 12.59 10.00 11.67
Hay racks 14.57 14.89 10.30 5.12 8.76
Reapers 14.89 10.30 8.13 5.12 8.76
Grain tanks 14.57 10.30 3.47 5.12 8.76
Sleds 5.66 4.50 6.82 3.20 5.12 8.76
Fanning mills 5.00 4.97 3.66 3.33 4.58
Horse weeders 5.97 6.63 7.21 4.44 6.17
Gasoline engines 3.92 3.92

In addition to the decline in value due to wear and tear a machine may become obsolete. After it has been in use for some time new machines may become available on the market which will do the work more efficiently. In such a case the value for service of the machine must be considered and the annual amount of the depreciation be adjusted accordingly.

In estimating the depreciation of farm machinery the residual value of the machine should not be overlooked. After the period of usefulness for the particular purpose for which it
was bought is ended, a machine may still be useful for other purposes. In addition the materials of which it is constructed will almost always have a scrap value.

The same methods of estimating the depreciation of farm buildings will be applicable in the case of farm machinery.

TOOLS AND MISCELLANEOUS MINOR EQUIPMENT.

All farm implements not included in the various classes of machinery and all tools are to be included in this account. There is no sharp distinction to be drawn between farm tools and farm machinery. Articles of small value and which permit of use for only two or three years are usually considered as tools rather than as machinery, although the character of the article as well as its period of usefulness is to be considered.

All tools and implements should be valued on the basis of the original purchase price with due allowance for depreciation. It is impractical to attempt to estimate the depreciation on the individual tools. It will also be very difficult to establish a general rate of depreciation for all tools since some articles may be of service for twenty-five years or more whereas others will not last one year. The best plan will be to take a physical inventory of all tools and miscellaneous minor equipment at the end of each year and to make an adjustment charge for depreciation on the basis of this revaluation. If this plan is followed out all tools acquired should be considered additional equipment, i.e. charged to the Tools account even though they may have been secured to replace other items.
HARNESS EQUIPMENT AND SUPPLIES.

This account is intended to provide a record of the relatively more important forms of the harness equipment on hand. Just what items will be considered as harness equipment and consequently are to be included in this account will depend upon the individual judgment of the farmer. Articles of a very short period of service should not be entered in this account but should be considered items of current expense.

The harness equipment should always be valued at its original cost price with due allowance for depreciation. The rate of depreciation of harness equipment will vary widely depending upon its quality and the character and amount of its use, also upon the care it receives when not in use.

GENERAL SUPPLIES.

Every farm has supplies of a miscellaneous character on hand, such as lumber, cement, lime, nails, fencing material, etc. Just what use will be made of these cannot be known at the time. These should be charged to the General Supplies account at their cost price, and then when they are used the charge should be transferred to the particular account which represents the use made of them. This will be done by debiting that account and crediting the General Supplies account. When materials of this kind are purchased and used at once they should be charged immediately to the account representing the use to which they are put.

LIVE STOCK.

THE VALUATION OF TEAMS.

In placing a value on horses and mules three bases may
be considered.(1).

1. The purchase price.
2. The selling price, i.e. the present market price.
3. The cost of production.

The horses and mules to be used as teams may be secured by purchase or they may be raised on the farm. If secured by purchase the most logical and satisfactory basis of valuation to use is the purchase price. The fluctuations in the market price of horses and mules are too uncertain to make it advisable to attempt to adjust the valuation in accordance with the same, even though at times the price may have risen or fallen appreciably below the value at which the horses and mules are carried on the books. Changes in the market price, however, should be considered in connection with estimating the depreciation of the teams.

In the case of the horses and mules raised on the farm the question will arise as to whether these should be valued in accordance with the price they will command if placed on the market or in accordance with the cost of raising them. In this instance the purchase price is out of the question so the decision must rest between the market price and the cost of production. The market price will be found to be the more satisfactory for the following reasons:(2).

1. The cost of production will be difficult to ascertain accurately (3) since in most cases the raising of horses is not a part of the

(2) Lauer, E. opus cit. p. 50.
(3) Lauer, E. opus cit. p. 50.
Warren, G.F. Farm management. p. 487.
main business of the farm. The colts are to be considered a by-product of the farm.

2. The market price gives a truer index to the amount of capital actually invested in the teams.

3. It is better to consider the cost of raising the horses and mules as a part of the regular team expense and then to consider the value (market value) of the horses and mules raised as an offset to the team expense rather than as separate farm income.(1).

There will be some question as to when the value of the horses and mules raised on the farm should be debited to the Teams account and credited to the Teams Expense account. This may be done at either of two times:

1. When the colt is weaned.(2).

2. When the young horse or mule is ready to be worked. The results so far as the accuracy of the accounts is concerned will be the same, but the accounts will be simpler if the transfer is made at the time the colt is weaned. If the second plan is used it will be necessary to carry the value of the colt as a credit inventory in the Teams Expense account until the time of the transfer to the Teams account.

SALES OF HORSES AND MULES.

If the horses and mules are valued on the books at the original purchase price less depreciation it may often happen in the case of the sales of such horses and mules that the price real-

ized is considerably higher or lower than the inventory value. Any loss or gain occurring in this way should be kept distinct from the current gain or loss due to the operation of the farm, as such sales are not regularly a part of the operation of the farm. For this reason the gain or loss should be entered in the Profit and Loss account directly.

DEPRECIATION OF TEAMS.

As in the case of the other classes of farm equipment a general rate of depreciation for horses and mules does not give accurate results. It is better to consider each animal separately. In the case of the younger horses and mules we may even have appreciation rather than depreciation. Although no attempt should be made to adjust the valuation of horses and mules directly to changes in the market price, such changes must be taken into account in estimating the depreciation.

Merely as a guide in estimating the depreciation it may be noted that horses are generally considered to reach a maximum value at from five to six years of age, and that their period of usefulness extends on the average until they have reached the age of fifteen, i.e. a period of ten years. During this period, then, the depreciation would amount to 10% a year. (1). It should be remembered, on the other hand, that there will be many cases in which the period of usefulness ends sooner than this or continues longer. The value of a horse at the end of the period of usefulness is a

quantity which may for all practical purposes be left out of consideration in this connection.

THE VALUATION OF DAIRY CATTLE.

Under dairy cattle are to be included all milch cattle, also the bulls which are kept as a part of the dairy herd for breeding purposes. The dairy cattle may be secured from either of two sources; they may be purchased or they may be raised on the farm. As in the case of teams the problem of valuation will be somewhat different according to which of these sources they were secured from. Three bases may be recognized:

1. The purchase price.
2. The selling price; i.e. the market price.
3. The cost of production.

When the dairy cattle are purchased the first basis should be used, (1) as the market price of dairy cattle fluctuates too uncertainly to permit of its satisfactory use as a basis of valuation. It must, however, be taken into account in determining the depreciation.

The dairy cattle raised on the farm may best be valued at the price they would command if they were placed on the market at the time they may be considered to become a part of the dairy herd. (2). The cost of raising them should be charged to the Dairy Operating account, and the same account should be credited with

(1) Krafft, G. Die Betriebslehre. p. 211.
(2) Krafft, G. opus cit. p. 211.
their value when they are added to the dairy herd. The reasons why the market price is a more satisfactory basis for the valuation of the live stock raised on the farm have already been given in the discussion of the valuation of the teams, and need not be repeated at this point.

There are two times when the animal raised on the farm may be considered to become a part of the dairy herd.

1. When it is weaned. (1).

2. When it becomes a producer.

Either time may be chosen at the option of the farmer, the results so far as the loss or gain in the operation of the dairy is concerned will be the same. In the event that the value of the young animal is included in the Dairy Cattle account at the time of weaning we shall have the appreciation in the value for the first few years as an offset to the depreciation of the herd as a whole, and in this indirect manner the cost of operating the dairy will be lessened to that extent. If the animal is considered to become a part of the dairy herd first when it has become a producer, its value during the period prior to this must be kept account of in the Dairy Operating account. This can be done by entering its value at the end of each year as a credit inventory, which serves again to reduce the expense of operating the dairy by that amount. In this event, care should be exercised that the interest on its value be included in the charge for the interest on the investment in dairy cattle.

THE DEPRECIATION OF DAIRY CATTLE. (2).

The depreciation of dairy cattle is due to decreasing productivity as the result of an increase in age, also to increasing liability to injury or death. The maximum money value of a dairy cow as a milk producer may be considered to be attained at the age of from four to six years. Her productive life will be from seven to eight years on the average. At the end of this period of usefulness her value will be measured by what she will bring on the block. High-priced dairy cattle will suffer a higher rate of depreciation than low priced cattle as they do not command any higher price, as a rule, when sold on the block than do the latter. In estimating the value of the dairy cattle at the end of their period of usefulness as milk producers it should be kept in mind, however, that some cattle do command a higher price on the block than do others. Also in the case of pure-bred cattle they may be retained for breeding purposes and their value will be affected by this fact. The annual depreciation of a dairy cow, then, will be the maximum value as a milk producer less the probable value when sold on the block divided by the number of years of service.

Let \( V \) = Maximum value.
" \( R \) = Value on the block.
" \( n \) = Number of years of service.
" \( D \) = Annual depreciation.

Then \( D = \frac{V - R}{n} \) (1).

Warren, G. F. Farm Management. p. 231.
When considering the depreciation of the dairy herd as a whole the loss by injuries and death should be taken into account. There are not enough statistics available, however, to permit of any accurate rate being established to cover this item. In the absence of such data it will be found more satisfactory to charge all such losses in the value of the dairy cattle directly to the Profit and Loss account of the year in which the losses occur, rather than to attempt to establish an arbitrary percentage rate, even though it is true that the losses would be more accurately distributed over a long period if an accurate rate could be found.

From the preceding discussion it will be noted that the depreciation of each animal should be estimated separately. The farmer should also keep in mind that it may be possible to eliminate much of the loss due to the depreciation of dairy cattle by a judicious selling of the dairy cows as their productiveness decreases.
Chapter VII.

The COST OF PRODUCING FARM CROPS.

The elements of cost entering into a manufactured product may be grouped under the following three heads: (1) Materials. 2. Labor. 3. General operating expense.

The cost accountant is confronted with the problem of ascertaining distinctly and accurately each of these items of cost. These elements of cost may further be arranged into two groups:


2. Indirect costs: General operating expense.

In the case of farm crops it will be found convenient to make a slight modification in this classification. In a manufacturing plant the power is distinctly to be considered as a general operating expense. On the farm the power is almost always supplied by horses, and in this case is more properly to be considered as a direct cost of production. The elements of cost entering into farm crops may then be classified as follows:

1. Direct.
   1. Materials.
   2. Labor.
      1. Man labor.
      2. Horse labor.

II. Indirect.

I. General operating expense.
   .1 Machinery Expense.
   .2 Building expense.
   .3 Insurance and Taxes.
   .4 Fertilizer expense.
   .5 Interest on the Investment.
   .6 Wages of management.
   .7 General expense.

MATERIALS.

Under this head are to be included all materials entering directly into the finished product. Items consumed in the process of production but not entering directly into the product are included under the head of general operating expense.

The chief and practically the only materials entering directly into farm products is seed. The seed may be secured from either of two sources:

1. It may be purchased.
2. It may be produced on the farm.

If purchased, its cost is accurately indicated by the price paid for it. In addition it should be charged for the expense of transportation. If the seed is produced on the farm, it will be found most satisfactory to value it on the basis of the market price. If the cost of production is more or less than the market price, it is evident that a loss or gain has been realized, but this loss or gain should be definitely assigned to the production of the seed and not to the production of the crop for which the seed is used. A more accurate analysis of farm operations will be secured in this way.

MAN LABOR.

The man labor on the farm should be divided into two
classes, viz.: regular labor and extra labor. Regular labor refers to the labor that is employed more or less steadily throughout the year and that is paid by the month or season. By extra labor is meant the labor that is hired from time to time and that is usually paid by the day or the hour. These two types of labor should be kept separate in the accounts because the cost per hour will be different, the cost of extra labor per hour being much higher than that of the regular labor.

The total cost of labor will consist of all cash payments of wages, the value of all farm products or services given in payment of wages, the value of all board and lodging given as part payment of wages, the rental value of all dwellings and land occupied by laborers who live on the farm, and the value of the labor of the farmer and members of his household who do not receive cash wages.

The first of these items will be easily determined as the exact amount is ascertainable. The second class of items are not so easily determined. If the farm products in question have a market price the price may be used to place a value upon the products. In such cases the farm value should be used, i.e., the market price less the cost of putting the goods on the market. Most products which are ordinarily given in payment of wages are capable of being valued in this way. Sometimes a part of the farm laborer’s remuneration may consist of certain privileges or services, as for example, the use of a team on certain occasions. The value of such services must necessarily be left to the judgment of the farmer but if they constitute a part of the remunera-
ation of the laborer they should always be included in estimating the total cost of such labor.

The third item of labor cost presents a more difficult problem. If the actual cost of the board is to be used as the basis of this valuation, it will be necessary to extend the cost accounts into the farmer's household. There are several reasons why such a procedure is not satisfactory.

The farmer's household expenses should be kept separate from the farm expenses, as the private affairs of the farmer bear no direct relation to the efficiency of operation of the farm.

The determination of the cost of board on the farm involves so many arbitrary values that accuracy in the majority of cases is impossible. It will be necessary to keep a complete record of the time of the women in performing the various household duties, a value will have to be assigned to their work, a value will have to be placed upon all garden and other produce used in the household, and other problems of a like nature will arise an accurate solution of which is a very difficult matter.

The value of the information secured is not commensurate with the cost of securing it. One of the chief aims of farm cost accounting is to secure relative or comparative costs rather than absolute costs. For this purpose it will not be necessary to know the exact cost of board. It is of more importance that the same charge be made throughout.

In view of these facts it will be found to be a better plan to value the board at the price that could ordinarily be obtained for it.
It often happens that the farm laborers who are married are given houses to live in, together with a certain amount of garden space and possible some live stock and poultry. These privileges are to be considered as part payment of wages. A value should be placed upon them and the Labor account should be debited with this amount. What this value shall be and how it shall be arrived at must be left to the judgment of the farmer because of the varying conditions in each case, but it should always be sufficient to cover all expenses connected with furnishing such accommodations.

With respect to the labor of the proprietor care must be exercised to separate the portion of his time devoted to ordinary manual labor from the portion of his time given over to what may be termed managerial duties. Almost every farmer spends a larger proportion of his time doing ordinary farm work which is on a par with the work of his employees. This is spent directly on particular enterprises and its cost should be charged to these enterprises, and it is the cost being the same as in the case of the labor of the employees. However, every farmer spends more or less of his time in managing and superintending the farm. This labor is supposedly of a higher grade than the ordinary manual labor and accordingly a higher value should be placed upon it. In addition, it is not so directly assignable to particular enterprises.

The following plan is suggested as a practicable one for making this distinction.
Assign a value to the proprietor's labor for the year, including in this valuation both kinds of labor. Keep an accurate record of the manual labor of the proprietor together with the enterprises upon which it is spent. Ascertain the average rate per hour of the employees' labor by dividing the total cost of their labor by the total number of hours they have worked. Ascertain the value of the proprietor's manual labor at the same rate. Debit the Labor account with this amount and credit the proprietor's personal, i.e., the Household account. The difference between this amount and the total value assigned to the proprietor's labor will represent the value of his managerial labor. This should be debited to a separate account, properly labeled to indicate its character, or to the General Expense account and a corresponding credit should be made in the Household account. The manual labor cost will then be distributed together with the cost of the labor of the employees among the different enterprises in accordance with the time spent on each. The managerial labor cost will be distributed among the different enterprises in accordance with the plan of distributing the general expense. As an illustration of the plan let us assume the value of the proprietor's labor for the year to be estimated at $600.00. At the end of the year the labor records show that the proprietor worked 2000 hours at ordinary manual labor. Suppose the average cost of the employees' labor is found to be 18 cents per hour. Multiplying the number of hours the proprietor spent in ordinary manual labor, i.e., 2000 by 18 cents an hour gives the cost of the proprietor's manual labor which in this case is $360.00.
Subtracting $360.00 from $600.00 gives a remainder of $240.00 which represents the value of the Proprietor's managerial labor.

The labor account must also include the value of the labor spent in the operation of the farm by members of the farmer's family even though these do not receive wages as such. The valuation of this labor should be based upon the average cost per hour of the labor that is regularly paid for.(1)

If the total cost of the labor at the end of the month is divided by the number of hours actually worked that month, the average cost of labor per hour can be ascertained. The labor cost should then be distributed among the various departments or enterprises of the farm in accordance with the amount of time actually spent in the operation of each. All labor spent in the operation of the farm should be converted into man hours. For example, if a boy is working on the farm and accomplishes one-half as much work in a given time as a man, each hour of his time should be recorded as five-tenths man hours.

The hour basis of distribution will be found to give more accurate results than the day basis, as it spreads the losses due to idle time over the operation of the entire farm for the month, rather than to permit it to fall upon one or two enterprises only, as would often be the case if the day basis were used.

HORSE LABOR.

The principal items comprising the cost of maintaining farm work horses are Feed, Labor, Cost of Shelter, Harness Expense, Depreciation, and Interest on the Investment.(1). In addition miscellaneous items, such as veterinary fees, shoeing, insurance, and the like, will need to be included when they occur.

Feed. This is easily the item of chief importance in teams expense, and if it is to be ascertained accurately, much care will need to be exercised. In considering the cost of feed it will be found convenient to divide the same into two classes, viz.:

1. Feed purchased.
2. Feed produced on the farm.

The farmer rarely finds it necessary to buy feed for his horses. When he does its cost is accurately represented by the price which he pays for it.

In estimating the value of farm products raised on the farm which are in turn consumed on the farm, such as feed, the market price should be used whenever it is available. It may be well to state briefly several reasons why this plan should be followed. One of these is that estimated or arbitrary valuations, although they cannot be wholly avoided in farm cost accounting, should never be used when more definite bases of valuation can be secured. A second reason is that since the farmer can actually realize the market price for his products, if he chooses to use these products on the farm their logical cost to him is the price he could obtain for them.

A third and perhaps the most important objection to using the cost of production as a basis for valuation is that the very products for which we are seeking a value are important items in determining the cost of production. For example: Feed is the most important item comprising the cost of horse labor and horse labor, in turn, is one of the most important items in the cost of production of farm crops.

In using the market price for determining the value of feed, due allowance should be made for the cost of transportation to the market. The feed is worth to the farmer the price he could get for it less the cost of placing it on the market. This is commonly known as the farm value.

Some of the products raised on the farm which are used as feed for horses do not have a definite market price. In such cases an approximate valuation is necessary. Pasturage is a product of this kind. When there are regular pasture rental charges obtaining in the community, as is sometimes the case, these should be used, if not, it will be necessary to ascertain the cost of maintaining the pasture and this cost will need to be distributed among the live stock in accordance with the use they make of the pasture.

The use of the pasture can be recorded in terms of pasture days; a pasture day representing one animal on pasture one day. Where live stock of different sizes uses the same pasture it ____________

(1). Warren, G. F. Farm Management. p. 484.
may be assumed, in the absence of a more accurate measure, that their consumption will correspond to their weight. For example: 1000 pounds of hogs will consume approximately as much pasturage as 1000 pounds of horses.

Labor. The amount of labor spent in caring for the horses will be secured from the labor record. This is valued at the regular rate for labor as determined each month from the Labor account.

Harness Expense and Cost of Shelter. All items of harness expense such as repairs, replacements, depreciation, and interest on the investment add to the cost of horse labor. Repairs and replacements of harness will be definite charges made to the Teams Expense account as they occur. The depreciation of the harness should be estimated at the end of each year according to the plan indicated on page 124. The amount of the depreciation should be a credit to the Harness Equipment account and a debit to the Teams Expense account. The interest on the investment in harness equipment should be estimated at the current rate and based on the average value of the harness equipment for the year.

The cost of shelter will be difficult to ascertain accurately. Since the buildings of the farm serve a variety of purposes, being used in connection with practically all farm enterprises it will be more convenient to consider the distribution of the buildings expense separately. In ascertaining the total teams expense, however, it is essential that the teams be assigned their proper share of expense of maintaining the farm buildings.

Miscellaneous Costs. The cost of shoeing, of veterinary fees,
medicine, insurance and other similar miscellaneous items of teams expense will be easily ascertained as they are always represented by definite charges which can be debited directly to the Teams Expense account as they occur.

Depreciation and Interest on the Investment.

The decline in the value of work horses is an item to be included in the cost of horse labor. The method of ascertaining the amount of the depreciation of the horses has been discussed on page 123. At the end of the year the depreciation should be represented by a credit entry in the Teams account and a debit entry in the Teams Expense account.

Interest on the Investment in the teams must be taken into account if accurate horse labor costs are to be secured. (1). In determining the amount of the interest the current rate obtaining in the community should be used and the calculation should be based on the average value of the horses for the year. Thus, if the horses are worth $1000 at the beginning of the year and depreciate during the year at the rate of 10% making their value at the end of the year $900, the average investment for the year would be $1000 plus $900 divided by 2, or $950. If the current rate of interest is 6% the interest on the investment would be $57.00.

Deductions from Horse Labor Costs. In ascertaining the cost of horse labor proper allowance should always be made for items which tend to decrease this cost. The chief item of this chara-

ter will be the natural increase in the horses. It has been suggested above that the expense in connection with the raising of colts be included in Teams Expense and that the value of the colts be considered a deduction of Teams Expense. A problem of importance to the farmer will be to determine to what extent he can reduce the cost of horse labor by raising colts. (1). When it is desired to ascertain definitely the amount of such reduction it may be found advisable to keep separate the expense of the colts from the expense connected with the other horses.

**DETERMINING THE COST OF HORSE LABOR PER HOUR.**

After the total cost of horse labor has been ascertained it is necessary to distribute this cost among the different enterprises of the farm. This should be done in accordance with the time the horses have been used in connection with each enterprise. (2). The horse labor record will indicate the number of hours the horses have been used in connection with each enterprise. Dividing the total cost of horse labor by the total number of hours worked will give the cost of horse labor per hour. Multiplying the rate per hour by the number of hours spent on an enterprise will give the share of the cost of horse labor assignable to that enterprise.

In the case of man labor it was suggested that the cost of labor per hour be ascertained for each month, and that the cost of man labor be distributed over the enterprises monthly. In the case of horse labor it will be more satisfactory to ascertain

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the cost per hour only at the end of the year.\(^\text{(1)}\). There are several reasons why this should be done.

1. The items of cost of horse labor are more varied than in the case of man labor and do not permit readily of accurate monthly charges.

2. The time the horses work varies so much at different times of the year that even if the cost for each month could be secured accurately and a monthly rate obtained by dividing the total number of hours the horses worked that month into the total cost, such a rate would not result in a just distribution of horse labor cost. The farmer can rarely buy and sell horse power as he needs it. In order to have sufficient horse power available in the summer months he must keep and feed horses in comparative idleness during the winter months. Figures collected by the Minnesota Agricultural Experiment Station show that the farm work horse in Minnesota averages about 3 hours of work a day during the year.\(^\text{(2)}\)

\[\text{In the winter months the average working time for a horse is approximately 1 hour a day, whereas in the summer months the average rises to 5 and 6 hours a day.}\]

\[\text{A part of horse labor costs of the winter months is therefore justly to be assigned to the enterprises upon which the horses are used in the summer.}\]

MACHINERY COSTS.

The principal items constituting the cost of maintenance and operation of farm machinery are repairs, and replacements, supplies, cost of shelter, insurance, depreciation, and interest on the investment.

The cost of repairs and replacements will be indicated by cash expenditures for this purpose and by the cost of the labor spent in caring for and repairing machinery. The supplies, such as oil, binder twins, and the like, will also be represented by cash expenditures. Insurance costs, if there are any, will be represented in similar manner. The machinery should be charged with a just proportion of the buildings expense, the amount of the charge being determined by the extent to which the buildings are used for housing machinery. The manner of estimating the depreciation of the machinery has been discussed on page 120.

The interest on the investment should be calculated at the current rate of interest obtaining in the community and should be based on the average value of the machinery for the year.

DISTRIBUTION OF MACHINERY COSTS.

The machinery should be divided into classes according to the enterprises in connection with which it is used. If the expense of each of these classes of machinery is kept separate, it will be much easier to secure a just distribution of the machinery costs among the different enterprises. In the case of the specialized machinery (corn, hay, dairy) all the costs will be charged to the respective enterprises. Only in the event that there are several units composing one enterprise, such as when
more than one field is devoted to the raising of corn, will it be necessary to keep a record of the work done by the specialized machines for the purpose of distributing their costs, and only in this case when it is desired to keep a separate record for each field or unit. In the case of the machines used in connection with more than one enterprise it is necessary to keep a record of the work done by the machines on each enterprise. The rate per hour for such machines can be found by dividing the total number of hours they are used into the total cost of maintaining and operating them.

BUILDINGS EXPENSE.

Buildings expense will consist of repairs and replacements, insurance, depreciation, and interest on the investment.

The repairs and replacements will be represented by the cost of materials and supplies purchased for that purpose and by the value of the labor spent in repairing buildings. This latter will be secured from the labor record in the case of the regular farm labor that has been so employed, whereas the value of extra labor that has been employed for this purpose will usually be represented by cash payments.

Only ordinary repairs and replacements should be included in buildings expense. If any extraordinary repairs or replacements are necessary because of some unusual occurrence, such as a fire or a storm, these should be charged directly to the Profit and Loss account. If such items should be included in the cost accounts these latter would not be of value for purposes of com-
parison, since the costs of this one year would contain items not ordinarily a part of the cost of farm operation. When such expense items are large it is advisable to open up a deferred asset account and by this means distribute the expense over a series of years.

The insurance premiums are always in the form of definite payments and their amount is therefore easily known. The manner of estimating the depreciation of the buildings has been discussed on page 112. Interest on the investment, as in the case of the other assets, is to be estimated at the current rate of interest on the average value of the buildings.

THE DISTRIBUTION OF BUILDINGS EXPENSE.

The buildings on the farm are used for a variety of purposes and it will be a difficult problem for the accountant to distribute their cost of maintenance among the different farm enterprises making use of the buildings. It is desirable, however, that this be done. The best basis of distribution will be found to be the space occupied in connection with each enterprise. Frequently there will be a certain amount of building space not directly assignable to particular enterprises, and in such cases a certain proportion of the buildings expense will need to be considered general farm expense and should be distributed among all the farm enterprises in accordance with the plan adopted for distributing such general expense.

INSURANCE AND TAXES.

Charges for insurance will always be associated with
particular assets and will thus form a part of the expense of maintaining such assets. At the end of the year the insurance should be distributed among the accounts representing this expense and in this way it will ultimately be charged to the various farm enterprises in accordance with the use they make of the assets.

Charges for taxes will be of a similar character. If there remains at the end of the year any undistributed portion of insurance and taxes, it should be charged to General Expense. Care must be exercised in the case of insurance charges to apportion these accurately to the years to which they belong, as frequently the premiums paid are for insurance extending over a term of several years.

FERTILIZER EXPENSE.

The accountant has two distinct problems with which to deal in connection with fertilizer costs. He must place a value upon the fertilizer and he must distribute it among the different crops upon some accurate and just basis.

Fertilizer may be purchased or it may be in the form of barn manure which is produced on the farm. In the first case its valuation is simple, the value being represented by the price paid for it plus the cost of transportation. When manure is produced on the farm its valuation becomes much more difficult. There have been many attempts made to value the manure produced by the live stock on the farm and different bases have been used, such as value according to increased crop yields, and value ac-
ccording to the market price of the fertilizer constituents. Attention may be directed to certain experiments of this character conducted by the Ohio Agricultural Experiment Station at Wooster, Ohio, the results of which are set forth in their bulletin No. 246. According to these experiments the value of fresh steer manure was found to be $2.92 a ton when based upon the market price of the fertilizer constituents and $3.73 a ton when based upon the value of increased crop yields. In the case of weathered steer manure the figures were found to be $1.80 when based upon the value of the fertilizer constituents, and $2.93 when based upon the value of increased crop yields. In addition to making an allowance for the variation in the fertilizer constituents of the manure from the different kinds of farm live stock, it must be noted that the net return from a ton of yard manure under general farming conditions depends upon the soil, the methods of cultivation, and the crops grown.

Although such experiments emphasize very clearly the importance of utilizing the barnyard manure in the operation of the farm, they do not furnish a practical basis for determining fertilizer cost as one of the items in the cost of producing farm crops. Especially is this true in the case of the value determined upon the basis of increased crop yields, for in this case, it would mean that the value of the factor of production is determined by the return it brings. If this same basis were adopted in valuing the other factors of production the expense of a farm crop would be exactly the same as the income, leaving no room whatsoever for the realization of a profit. Objection may
also be made to these bases upon the ground that it places a value upon the manure which is higher than the price at which the farmer could dispose of it if he chose to do so or the price he would have to pay for it in the event of purchase.

A more practical plan will be to value the manure as nearly as possible in accordance with its market value, making due allowance for the cost of transportation. It is important to secure as just a valuation of the manure as possible for the purpose of crediting the live stock as well as for the purpose of securing accurate crop production costs. In determining the value of the manure the cost of distributing it should not be taken into account, i.e. the live stock should be given credit for it in accordance with its value at the barn. The cost of distribution should be borne by the various crops, since this will vary with the location of the field and the difficulty or ease of access to it.

The chief difficulty encountered in distributing the fertilizer expense among the crops is that the benefit of the manure is not confined to one crop or to one year. The amount of the fertility supplied by the application of fertilizer to the soil, the crop, and many other conditions. With loam or clay soils a fair distribution in a four year rotation in which manure is used but once might be 40% to the first crop, 50% to the second 20% to the third, and 10% to the fourth crop after applying manure (1). In such a case the best plan is to charge all the fertilizer cost to the crop and then credit it at the end of the year with

the value of the fertilizer still in the soil, carrying this balance over as a charge against the next crop. Where annual applications of fertilizer are made, which are fairly constant in amount and character, the value of the fertilizer remaining in the soil may be ignored, since this amount will be practically constant from year to year. In such a case the entire value of each application will be charged to the crop for that year. The fertilizer record will show the amount of fertilizer that has been applied to each field.

INTEREST ON THE INVESTMENT.

There has been much difference of opinion among accountants in the past with respect to whether or not interest on the investment is to be considered an item in the cost of production. The latest writers on the subject, however, indicate that the general trend of opinion is in favor of so including it.\(^{(1)}\)

Interest on the investment may be said to represent the service of the fixed capital employed in the operation of the farm. As indicated above the factors of production on the farm may be divided into three classes, viz.: land, farm equipment, and labor. The service furnished by labor is represented by the current expenditures for labor in the form of cash and miscellaneous services. It is not necessary to make a permanent investment of capital in labor. In the case of land and farm equip-

Webner, F. E. Factory Costs. p. 159.
ment, however, in addition to the current costs represented by actual expenditures, it is necessary to invest a certain amount of capital permanently. All capital, as such, has a certain earning power. If the farmer does not invest his capital in land and farm equipment he will be able to realize a return from it by investing it elsewhere. Investments can always be found which involve no practical risk and which necessitate practically no attention on the part of the owner of the capital. If the farmer does not realize a return on his investment in land and farm equipment at least equal to the return he would realize if his money were loaned out on good security, or if were placed on interest in a bank, it is obvious that he is operating his farm at a loss. (1).

Much of the opposition to including interest on the investment as a part of the cost of production is due to the confusion between the interest which is actually paid out on money borrowed and the interest which represents the service performed by capital. It is true that if the interest charge were represented by actual payments of interest on money borrowed that the cost of production would vary with the extent of the farmer's indebtedness, which is absurd. (2). But such interest is to be considered a deduction from profit, not an item in the cost of production. The interest on the investment that does constitute a part of the cost of production is the earning power of the capital.

that is invested in the land and farm equipment, whether it is wholly or only partly owned by the proprietor of the farm.

The interest on the investment can be distributed most accurately among the departments of the farm by estimating it separately on the land and on the different forms of farm equipment. Since the interest on the investment does not mean actual expenditures of money, a corresponding credit must be made to the Profit and Loss account to balance the charges for the same. It will be most convenient to credit all interest on the investment to a separate account labeled as such and then to transfer the sum of these credit entries in one amount to the Profit and Loss account.

GENERAL EXPENSE.

On every farm there will be a certain amount of expense which is miscellaneous in character and which is not incurred in connection with any particular enterprise but which is nevertheless an essential incident in the operation of the farm. Such general expense adds to the cost of producing farm products and some basis must be secured in accordance with which it can be distributed justly among the different farm enterprises.

Cost accountants for manufacturing plants have devised many plans for distributing the general expense. (1). The general aim of these is to apportion such expense among the departments or enterprises in the proportion which the operation of those de-

Rowe, H. M. Bookkeeping and Accountancy. p. 213.
Webner, F. E. Cost Accounts. Ch. 18.
partments or enterprises bear to the total operations of the concern. Some of the bases preferred for this apportionment are:

(2).

1. The direct wages paid.
2. The hours of labor spent.
3. The materials used.
4. The direct wages plus the cost of materials.
5. The units of product.

In considering the application of these to the farm the first and second bases may be considered to work out the same since all man labor cost on the farm is charged to the enterprises at a uniform rate. The materials entering into farm products bear a much smaller proportion to the total cost than in the case of ordinary manufactured products. Their cost is, therefore, not so accurate an index of the relative importance of the different enterprises in the operation of the farm. The units of product on the farm differ so greatly in character that such a basis is clearly not practicable. In addition to the bases indicated manufacturing plants in which the process of manufacture centers largely around certain machines or groups of machines frequently use what is designated as the scientific machine rate in order to distribute their general expense, but these conditions also do not obtain on the farm.

(2). Hatfield, H. R. Modern Accounting. p. 213.
It would seem, then, that the best plan for the farm is to distribute the general expense on the basis of man labor cost. In accordance with this plan each enterprise will be charged with such proportion of the general expense as the labor cost incurred in connection with that enterprise bears to the total cost incurred in the operation of the farm.
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**Note:** This form is for recording the usage and costs of farm machinery. Each entry should include the date, number of hours used, type of machinery, cost, and any relevant remarks.
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Form No. 6
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<th>Hay, Forage, Roots, Straw—Tons</th>
<th>Grain, Grass-Seed, etc.—Bus.</th>
<th>Grade of Crop</th>
<th>Disposition, Storage, Etc., of Crop</th>
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Form No. 7
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<th>Date or Period of Birth</th>
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<th>Weight of Offspring</th>
<th>Markings and Identification of Offspring</th>
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FORM No. 0.
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<th>Amount</th>
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<th>Time to Run</th>
<th>Date Due</th>
<th>Interest or Principal</th>
<th>Date Paid</th>
<th>Total Due at Maturity or Settlement</th>
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"Form No. 3"
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**Total No. of Hours**

**Rate Per Hour**

**Total Cost of Labor**

**Form No. 19**
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Form No. 121.
### MONTHLY LABOR DISTRIBUTION SUMMARY

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<th>Rate Per Hour</th>
<th>Total Cost of Labor</th>
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**Cash Wages,** - $ __

**Board,** - $ _

**Other Costs,** - $ __

**Total Cost,** - $ __

**Total Hours Worked,**

**Rate Per Hour,** $ __
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**Form No. 16**